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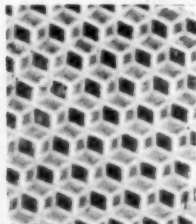
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The Cover

As may be surmised from the contents of this Journal, it is in part a memorial to Langstroth's discovery of the bee space one hundred years ago. The account by Dr. Phillips in the first article reached us two months before his death. Phillips was long a Langstroth historian and champion. The picture on the cover is one to which Phillips refers in his Andover address: "Among my Langstroth materials are two photographs, the earlier taken when he was perhaps in his forties, and the second in his old age. The first is a firm face not unkind but rather forbidding (page 411). The second (on the cover) is that of a kind, warm-hearted grandfatherly man. His glasses have slid down a bit on his nose and there is a smile on his face."

Those who have been so interested in our cover contest are assured that the contest will continue for the rest of the year. So try your luck. If your picture is chosen for the cover we will pay you \$10; if it is not suitable for the cover but is kept for inside use it will be paid for at the usual contributor rates.

CORRECTION . . .

We are very sorry that a typographical error was made in the September issue on page 372. The article by G. F. Townsend about the Apiculture Department at Ontario Agricultural College was entitled The Agriculture Department.

Sugar Prices May Tumble

The Wall Street Journal on September 18, 1951, in a special report on price and production trends affecting industry, reported that dealers say refined sugar may take a new price tumble soon. The refined product now sells for \$8.50 a hundred pounds against \$8.75 in July. Ordinarily the cost of the sweet during the warm months is firm, as soft drink makers buy heavily; this summer the effects of big production and earlier stocking-up are being felt.

So far this year some 5,300,000 tons of sugar have been delivered to U. S. users, 11 per cent less than a year ago. The Government has made 8,250,000 tons available this year to consumers, but dealers think deliveries may not reach 7,800,000. In 1950, a year of scare buying, deliveries amounted to 8,250,000 tons, but actual consumption was only about 7,850,000 tons.

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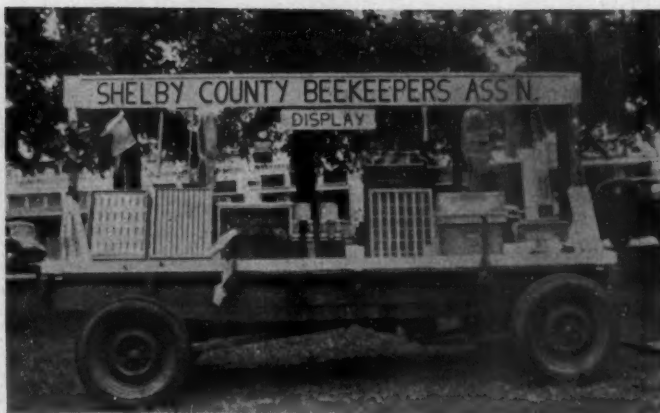
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American Rabbit Journal

DEPT. B. WARRENTON, MISSOURI



E. J. Morton, secretary-treasurer of the Shelby County (Tennessee) Beekeepers Association, sends this picture of the trailer they used this summer to create an interest in beekeeping among the farmers and business men of the town. The trailer was loaded with equipment, honey and an observation hive of bees. It created a lot of interest and the association meeting held at that time was quite successful. Here is a way to build up interest by showing people something tangible.

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Vol. 91, No. 10

October, 1951

THE AMERICAN BEE JOURNAL

HAMILTON, ILLINOIS

Editor—G. H. Cale

Associate Editors—M. G. Dadant, Roy A. Grout

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What's Going On

Middlesex County Beekeepers' Assoc. Waltham, Mass., October 27

Middlesex County Beekeepers' Association will hold its first fall indoor meeting at their regular winter quarters at the Waltham Field Station of the Massachusetts State Experimental Building, Beaver Street, Waltham, Mass., on October 27, 1951. The meeting will start with a buffet dinner at 6:30 P. M. followed by the regular business meeting at 8 P. M. Afterwards John Furber, Secretary-Treasurer, will show colored slide pictures taken at the outdoor meetings during the 1951 season. Beekeepers in the county are invited to attend.

John H. Furber, Sec'y-Treas.

Illinois State Beekeepers' Assoc. Annual Convention

Springfield, November 9-10

Illinois beekeepers should keep in mind the dates of the Annual Convention this year and arrange to attend. This important meeting will be held in the St. Nicholas Hotel on Nov. 9 and 10. Watch for further announcement next month.

Annual Convention

Washington State Beekeeping Assoc. Seattle, November 26-27

The Annual Convention for 1951 of the Washington State Beekeeping Association will be held in Seattle on November 26 and 27. The Security Farmers Market has offered the use of their Club Rooms; daily broadcast 11:45 A. M. to 12 noon both days over KOL; and exhibit space throughout the market on both levels. This will be the greatest exposition and educational event in western history. A large, well organized committee is carrying plans to completion.

A. M. Walrath, General Chairman

Minnesota Amateur Beekeepers' Assoc.

Fall Program

Beekeepers are invited to attend the monthly meetings of this association held at 7:30 P. M. the first Friday of each month in Room 8, Horticulture Building, University Farm, St. Paul 1, Minnesota.

Membership is now \$1.50 to January 1, 1953 and includes membership in the Horticulture Society and magazine. The following will be the fall meetings:

September — "Fall Management"

by Dr. Haydak plus pictures and other speakers.

October — "Beekeeping in India" by students from India plus pictures.

November — "Pooling our Orders" — open discussion.

December — "Planning for 1952" by newly elected president. Annual business meeting in the private dining room of the University Farm Cafeteria at 5:30.

Nebraska Honey Producers Annual Meeting

Lincoln, October 18

The annual meeting will be held in connection with Farm and Home Week at the College of Agriculture, Lincoln, Nebraska on Thursday, October 18. This will be a full day meeting with a banquet and short session in the evening.

Edw. A. Wolfe, Sec'y

Wisconsin State Beekeepers Assoc. Annual Convention

Wausau, October 30-31

The annual meeting will be held October 30 and 31 at Marathon County Park, Wausau, Wisconsin. The program this year will be in the form of topics, each topic to be conducted by a moderator. These discussions will include the following:

This season's honey crop—producing and selling—H. J. Rahmlow.

Are we prepared for winter?—Henry Schaefer.

Is Nosema our worst enemy?—John Long.

Pollination—Robert Knutson.

Round table on honey promotion, bottling, etc.—Walter Diehnelt.

Spring management. Shall we feed in the spring?—William Judd.

There will be reports from the Central States Bee Culture Laboratory and a talk by Art Kehl, Watertown. Entertainment at the banquet will be provided by the Marathon Co. Beekeepers Assoc. Plan now to attend. Wisconsin Horticulture

Florida State Beekeepers Assoc. Annual Meeting

St. Petersburg, October 22-23

The Florida State Beekeepers Association is holding its annual meeting Monday and Tuesday, October 22 and 23, in St. Petersburg, Florida, at the Soreno Hotel.

The theme of the meeting this year will be centered around advertising honey from the most practical

viewpoint. Beekeeping subject matter of interest to all beekeepers will also be given on the program, and one beekeeper will be honored at the banquet with a meritorious service award. Those receiving this meritorious service award so far are: Mr. R. E. Foster, retired apiary inspector; Mr. L. M. Lewis, Havana, past president of the Florida State Beekeepers Association and Mr. L. M. Dewey, Merritt Island, also past president of the Florida State Beekeepers Association.

Mr. Willard M. Fifield, Director, Agricultural Experiment Station, will act as toastmaster at the banquet.

In addition to the program on advertising honey and beekeeping, there will be small exhibits on different methods of advertising honey to the retail consumers displayed in the lobby of the hotel. One of the outstanding speakers on the program will be Mr. H. C. Dadant, who will discuss the progress done in disease resistant hybrid bees.

Beekeepers will start registering at the Soreno Hotel Sunday night, October 21.

A honey queen selected from the district beekeeping sections will be crowned on the night of the banquet. Miss Frances O'Neill, Haines City, is the honey queen for 1951.

John D. Haynie, Chairman
Program Committee

Georgia Beekeepers Assoc. Annual Meeting

Tifton, November 13-14

The annual meeting of the association this year will be held November 13 and 14 at the Abraham Baldwin Agricultural College, Tifton, Georgia.

J. H. Girardeau, Jr., Sec'y.

Tazewell County Beekeepers Assoc. South Pekin, Ill., October 7

The Tazewell association has scheduled the next meeting for October 7 to be held at the home of Floyd J. Strope in South Pekin. Since this is to be the last meeting of the season, we urge all members and friends to attend. Individual notices will be mailed in due time.

Joseph Jachman, Sec'y.

Indiana State Beekeepers Assoc. Annual Meeting

Indianapolis, October 27

The annual meeting of the Indiana association will be held Saturday, October 27 in the World War Memorial Building in Indianapolis. A good program is in the making. Plan to attend. Albert J. Thomas.



Lorenzo Lorraine Langstroth

Adapted from an address prepared by Dr. Everett Franklin Phillips shortly before Doctor Phillips' death. The address was read by his friend, George Rea, at the unveiling of the Langstroth Plaque in South Church, Andover, Mass., July 22, the church of which Langstroth was once the pastor.

The "Father of American Beekeeping" in the prime of life.

Lorenzo Lorraine Langstroth was born on Christmas day, 1810, in Philadelphia. At a suitable age he entered the Preparatory School of the University of Pennsylvania and later Yale University. His courses were largely classical and he showed no inclination toward the ministry until the autumn of his senior year at Yale when Peter Parker, a fellow student, stimulated a religious revival and Langstroth became his first convert, deciding to devote his life to the ministry. In 1831 he joined the Congregational Church and entered divinity school at Yale. He became pastor of South Church, Andover, Mass., in May 1836 but was relieved of his duties in March, 1839, at his own request, because of illness.

His experience with honey bees began in Andover. At Greenfield, Mass., where he conducted a school for girls, he searched the neighborhood for beekeepers from whom he might learn the skills of the craft. In 1848 he opened a school for young women in Philadelphia, and moved his bees to West Philadelphia.

He soon saw the need of a hive opening at the top so all combs might be seen at once, but such a hive increased the problem of separation of the comb attachments on the hive sides. He also saw that it was urgent that the hive be increased in size at times during the year and that the best place to put additional space was at the top. When he placed a second story over the first, using bars, the bees stuck the two hive parts together so firmly as to make separation difficult or

impossible. (How he overcame this difficulty and devised the present hive is well told in the article by Kent Pellett on the next page.)

The spring following his discovery of the bee space he had the wooden pieces ready for making his hives over into movable frame hives, and assisting him was a beekeeper and skilled cabinetmaker, Henry Bourquin, who took over the management of the West Philadelphia apiary. While they were working on the somewhat difficult task of changing over the hives, an old beekeeper friend entered the apiary but Langstroth was so engrossed that he did not detect his presence. Finally his guest shouted out, "Friend Langstroth, you are so taken up with your new hive that you seem unable to hear me, or to see anything else. No doubt you think you have made a great invention; but I say you have made no invention. Friend Lorenzo, you have made no invention at all, but rather, a perfect revolution in beekeeping. You have what I have long wished for—that control of the combs of the hive, by which you can at any time know the condition of your bees; and if anything goes wrong, be able to apply the proper remedy."

The use of the Langstroth hive increased in the United States and Canada with great rapidity. Before long this system had been extended to other shores and long before Mr. Langstroth's death the movable frame hive became standard equipment throughout the world.

Shortly after Langstroth's discovery, he began making plans for

the introduction of his new beekeeping methods and decided to sell his school and return to Greenfield which he thought to be a more favorable place for the work ahead of him. He at once decided to write a book to set forth his new methods and this classic work was published in Greenfield in May 1853 under the title, "Langstroth on the Hive and the Honey Bee: A Beekeeping Manual."

In 1860, S. B. Parsons of Flushing, Long Island was successful in introducing Italian queens and, at his invitation, Langstroth spent some time in Flushing rearing Italian queens and distributing them to interested beekeepers. This was his second line of attack on improving the conditions of beekeeping in this country.

In later life, he moved to Oxford, Ohio, to live with his daughter, after the death of his wife. Aside from two revisions of his book and occasional articles, his writings are few, but they show a keenness of reasoning which is conspicuous in every written record that he left.

On October 6, 1895, Langstroth prepared himself to attend morning service at the Presbyterian church in Dayton, at the invitation of the pastor, Amos O. Rabor. He spoke as follows: "I am a firm believer in prayer. It is of the love of God that I wish to speak to you this morning—what it has been, what it is, what it means to us, and what we ought —" He hesitated; his feeble body straightened out convulsively; his head fell forward. He was at rest. It was the long rest.

How Langstroth Began as a Beekeeper

by Kent Pellett

Reprinted from November 1938
American Bee Journal

Langstroth in middle age.



SINCE this is the 100th anniversary of the date when Rev. L. L. Langstroth became a beekeeper, I have been asked for a story on "how and when" he became interested in bees.

The when is easily answered. But how did the inventor of movable frames and the greatest of American beekeepers become interested in bees? Who knows?

How did it happen that the great Dutchman, John Swammerdam, nearly 300 years ago was so engrossed with bees that he neglected his calling as a surgeon and estranged himself from his father and his best friends by his peculiar hobby?

Why was it that Francis Huber, the Swiss naturalist, 150 years ago could not give up watching bees even though he was blind? Does anybody have an answer?

As a little child Langstroth had a passion for bees. He played with insects and used them for strange experiments so much he disturbed his parents, who tried to put an end to such foolish ideas.

At school his teacher, a practical soul who could see no further than the three Rs, punished him for caging flies when he should be studying. But he continued to wear out his trousers following his pets about on his knees.

Langstroth was a bright young man. Bright young men of 100 years ago became preachers, lawyers and doctors. Who could see a calling then in bees? Beekeepers were not past the gum stage, and they might hope to harvest enough honey to

supply their families from year to year.

It is likely that Langstroth deliberately put away his interest in bees and insects as being a childish thing, having had it drummed into him that it was no good for making money. But how measure money making possibilities? What is looked on as trash today may command good money in the market tomorrow. Some day we may learn to let children follow their bent.

Langstroth went to Yale and graduated in 1831, married and entered the ministry. Bees seemed far from his thoughts. But he visited a friend, found a globe of honey on his friend's table and swarms of bees in his attic. All his old interest came rushing back. When he returned home he took with him two colonies of bees.

His beekeeping was not extensive. Ten years later he had a small apiary on the outskirts of Philadelphia. He studied the habits of his bees, and he had to observe with great care to be sure he made no mistakes. There were no American bee books, and no magazines. Langstroth himself was to write the first book, and to be one of the chief early contributors to the first magazine.

Gradually he built up his library. He procured Virgil's *Georgics*, good poetry if they did not give much practical help, and later Huber and Bevan.

But Langstroth's health was not good. He was subject to attacks of melancholy which so afflicted him that he could not attend to his work for weeks at a time. At length he

had to resign his pastorate, and in 1848 he established a school for young men at Philadelphia, hoping it would exact less of him than his church.

He turned to his bees for solace, but applied himself so intensely that at length a severe attack of melancholy was brought on. Then, he could not bring himself to think of them, and even the sight of the letter "B" nauseated him.

It is hard to realize his handicap. He repeatedly built up his apiaries only to be compelled to sell them because of his sickness. At times he even had to separate from his family because he was unable to contribute to their support.

When he could, however, he was working with his bees. He made several of Huber's leaf hives and some of Bevan's hives, in which the combs were suspended on movable bars. He found himself wrestling with the problem of making movable combs so he might readily watch the activities of his bees and control them.

The cover of Bevan's hive rested on the comb bars, and the bees usually glued the combs together, making the hive hard to open. Langstroth lowered the bar supports so the hive cover did not touch the bars and the bees could not glue it to them. He had caught a new idea! The bees could not use their glue at the points separated by sufficient space! Unknowing, he had the principle in his hands which would transform beekeeping through the movable frames.

(Please turn to Page 435)

LORENZO L. LANGSTROTH

1810 - 1895

PASTOR OF THE SOUTH CHURCH
ANDOVER, MASSACHUSETTS

MAY 11, 1836 - MARCH 30, 1839.

ERECTED IN THE CENTENNIAL YEAR OF HIS
DISCOVERY OF THE BEE SPACE AND HIS INVENTION
IN 1851 OF THE MOVEABLE FRAME WHICH MADE
MODERN BEEKEEPING POSSIBLE.

DEDICATED JULY 22, 1951

BY

THE MASSACHUSETTS FEDERATION
OF BEEKEEPERS' ASSOCIATIONS

IN RECOGNITION OF HIS OUTSTANDING WORK
IN BEEKEEPING.

Stephen A. Lovejoy, Jr., of North Andover, Mass., sent us this fine photo of the Langstroth Plaque which was dedicated at Andover on July 22 by the Massachusetts Federation of Beekeepers' Associations. Mr. Lovejoy served as Chairman of the Committee for the dedication. Note the photo shows the movable frame and bee space.

Milestones in American Beekeeping

by Edw. A. Wolfe

TO many people, and this includes some of our present day beekeepers, the industry of beekeeping is a backyard hobby. They do not realize—certainly they do not appreciate—its contribution to the daily welfare of every man, woman, and child in our nation. Nor do they appreciate it is a billion dollar business if you want to put it in terms of dollars and cents. Nor do they appreciate the romance of the past, the resourcefulness or the inventive genius that has kept the industry abreast of the progressive tide that has made our country the envy of the world.

The keeping of bees, and the resulting production of honey and wax are not at all new in this country.

Beekeeping became established as a part of our economy at about the same time as some of our early colonies. One record sets the date at 1630 when our first honey bees arrived. Their arrival was significant because of at least two reasons. First, they were not native in this

country, and second, the honey and wax were vital necessities. The business of beekeeping spread rapidly during the following years even though the equipment used must have been very crude when compared to the present time. Although one can guess with reasonable certainty that early beekeepers made efforts to improve their equipment and methods of husbandry, it is interesting to note that little of general acceptance was developed until almost a century later. Also, there is little information available as to kinds of honey produced then, or the floral sources, although there is mention that sweet clover was first observed in America in the 1730's. It was considered a weed and many called it the "bee plant."

Apparently as long as the beekeepers were forced to use equipment available in those days, their operations and success were limited. With beekeepers as in any other field of endeavor, necessity is the mother of invention. Dozens of va-

riations of hives, in different shapes and sizes, were tried and with the exception of a few where temporary popularity followed, all were discarded for one reason or another within a very short time.

Many attempts were made to use a movable frame. This dates back to the early Greeks. Improvements in the hive were added by Dzierzon. Later, Huber developed his leaf hive. Further modifications were added by Quinby and it was not until 1838 that Langstroth began his studies. In 1851, he had completed his hive with movable frames. This allowed space for the bees between the top of the frames and the covers. And then, it occurred to him that a hive containing frames with space on all sides for the bees would not only simplify management of the colony but at the same time do away with the necessity of cutting the combs from the side walls. This idea was completed and patented in 1852. The idea in itself is so simple that it (Please turn to Page 441)

Dr. Jacob Schramm (left) and F. W. Schwoebel making first planting at Morris Arboretum, April 7 of everflowering locust for Langstroth Memorial Garden of Honey Plants.

Rock wall in spring—Morris Arboretum.
Swan pond in the Arboretum showing marble Italian temple.

Langstroth Bee Garden

Dedication services for the Langstroth Garden at the University of Pennsylvania will be held at the Morris Arboretum, Chestnut Hill, Philadelphia, October 20 at 2 p. m.

Program

Invocation—The Reverend Burleigh Cruikshank, D.D., L.L.D., Minister, Presbyterian Church of Chestnut Hill.

Welcome to Guests—Dr. Edwin B. Williams, Provost of the University of Pennsylvania and Chairman of the Committee on Administration of the Morris Arboretum.

The Langstroth Bee Garden—Inception and Objectives—Dr. J. R. Schramm, Director of the Morris Arboretum.

Langstroth and the Academy of Natural Sciences—M. Albert Linton, President of the Academy of Natural Sciences.

The New Role of Honey Bees in Our National Economy—Dr. James I. Hambleton, in Charge of Division of Bee Culture, United States Department of Agriculture.

Introduction of Mr. E. F. Phillips, Jr., who will read the following paper completed by his father before his untimely death on August 21—Edwin J. Anderson, Professor of Apiculture, Pennsylvania State College.

Langstroth—Philadelphia Beekeeper—Dr. E. F. Phillips, late Professor Emeritus of Apiculture, Cornell University.

Unveiling of the Lorenzo Lorraine Langstroth Memorial Bench by William Langstroth Cowan of Toronto, grandson of L. L. Langstroth.

Dr. Jacob Schramm, Director of the Morris Arboretum, deserves the thanks of all beekeepers in initiating and forwarding this project. Credit for originating the idea for the garden is due in large measure to Fred. W. Schwoebel of Philadelphia.

Apiculture Laboratory

Langstroth was further honored in this centennial year at the dedication of a new apiculture laboratory at the University of Maryland (see photo bottom right). This took place on June 16, 1951. The dedication was made by George J. Abrams, Apiculturist at the University of Maryland, and the Langstroth centennial address and presentation of a historic Langstroth hive were made by Dr. E. F. Phillips of Cornell University. James I. Hambleton, head of the U. S. Bee Culture Laboratory, spoke on the value of honey bees to man, showing how Langstroth's invention of the movable frame made possible the pollination service of the honey bee today. The all-day program included a luncheon and inspection of the laboratory and exhibits, and various contests and demonstrations.

October, 1951



On the Impregnation of the Eggs of the Queen Bee

by Rev. Lorenzo L. Langstroth

MANY singular notions have prevailed respecting the generation of bees. Virgil asserted that bees have no sexual intercourse, but gather young from the leaves of plants. New colonies he thought, could be obtained from the carcasses of animals. Swammerdam, in his observations on bees, made in 1673, proved, by careful dissection, that the bee commonly called the King, is a female, and the mother of the whole colony, and that the drone is the male bee. He thought that a seminal atmosphere proceeded from the drones and caused the impregnation of the female, or as she is commonly called, the Queen.

Maraldi (1712) conjectured that the eggs of the Queen were fecundated by the drones after being laid in the cells. Arthur Dobbs (*Philosophical Transactions*, vol. 46 for 1760) was, I believe, the first who suggested that the Queen may have a spermatheca, from the contents of which the eggs are impregnated. DeBraw (*Phil. Transac.* vol. 67 for 1777) imagined that he saw drones depositing semen in cells containing eggs. Both Huber and Dr. John Hunter have shown that he was mistaken. The latter supports the theory of Dobbs, and endeavors to strengthen it by some curious experiments which he made on the impregnation of the eggs of the silkworm. (*Phil. Transac.* vol. 82 for 1792.) Huber? (1788) was the first to demonstrate that the sexual union of the Queen and drone takes place when the insects are on the wing, in the open air; and that a Queen, when impregnated, will continue, at least for several years, to lay fertile eggs without any further intercourse with the male. He thought that she was impregnated for life, but he was not able even to conjecture how all the eggs in her ovary could be at once fecundated. Dzierzon, a German apiarian of

great practical knowledge, has revived (1845) the notion of a permanently impregnated spermatheca. He says that he has dissected Queen bees both before and after impregnation, and that he has found the seminal sac in the first case to contain a limpid fluid like water, and in the second case to be filled with a substance resembling the semen of the drone. This would seem almost to settle the question; but unfortunately he advances a conjecture which seems to be at variance with the idea that he had much skill in dissecting. He thinks that what is the poison sac in the worker becomes the spermatheca sac in the Queen! Now, the poison sac, with the sting and all its appendages, is entirely distinct from the spermatheca, and can easily be recognized without the aid of the microscope. He does not seem to have examined, microscopically, the fluid in what he calls the seminal vesicle, in order to demonstrate, by the presence of spermatozoa, that it was the semen of the male. As I am not aware that this has been done by any one else, I hereby communicate to the Academy the results of such an examination made last month, by Dr. Joseph Leidy of this city.

The Queen dissected was taken from an observing hive in which she had been lodged the Summer of 1851, having accompanied a first swarm from a hive which had been swarmed in 1850. I am certain that she was not a Queen of the current year, for she commenced ovi-depositing in the empty cells which the hive contained, the same day in which she was put into it; whereas young Queens, which are not impregnated until after they are established as heads of a new colony, do not begin to lay until after the lapse of several days. I know that she was the same Queen lodged by me in the hive, as the bees were in a hive of my own invention, in which they were exposed to the

full light of day, and were under constant inspection. She was therefore nearly two years old. The males in this colony had all been killed in August, and there was not one in the hive (Jan. 27th) when she was taken from it.

Plate XIX in Swammerdam's *History of Insects*, represents very accurately all the parts which were particularly examined. The small globular vessel (fig. 3t) which Swammerdam thought secreted a mucous fluid to attend the eggs to the bottom of the cells was found to be the true spermatheca. Its internal diameter was the 1-33d of an inch, and it was distended with a whitish viscous fluid which, when examined by the microscope was found to be filled with spermatozoa.

I consider, therefore, that this dissection demonstrates that the Queen bee has a reservoir in which the semen of the male is lodged, and that the eggs are impregnated as they pass by the duct leading from the spermatheca into the oviduct.

1. Aristotle informs us that some cultivators called the rulers or kings, mothers, and the drones, males.

2. Hattorf and Schirach (1770) believed that the Queen was self-impregnated; and the latter accounted for the existence of males by conjecturing that their semen formed the food for the young bees.

Note — Since this paper was written Dr. Leidy has examined two more Queen bees, each of which had the spermatheca distended with the spermathecal fluid. These Queens were both reared last Summer from eggs in worker combs, which were furnished to colonies deprived of a Queen. The construction of the hives allowed the whole process to be distinctly seen.

(Copied from the Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 6, pp. 49-50, 1852, by Frederick W. Schwoebel.)

The Gap Becomes Wider

In a letter discussing plans for accomplishing the best results in the pollination of alfalfa in Minnesota, a correspondent stated, "The gap between honey production and pollination becomes wider." This brings to mind a statement made by Lyman Coe of the Samuel Roberts Noble Foundation that he didn't think a honey producer was ever going to become a good pollinator, and that the Foundation was starting a program of training about ten boys in the keeping of bees strictly for pollination purposes.

It is true that most beekeepers who have worked seriously at the pollination of legume-seed crops, have found that the program of

honey production infringed in one way or another upon the results they were attempting to attain in seed production. The result has been that these men have turned from honey production to the keeping of bees for pollination of crops.

We think there is a lot in these statements. In our opinion, beekeeping in the legume seed producing areas is facing a revolutionary change. This change will involve methods of keeping bees, beekeeping equipment, and even strains of honey bees used for this specific purpose. Planned pollination as an agricultural practice will become a new science—a different system of beekeeping.

Let's Quit Advertising to Ourselves

The recent Nebraska Bee Tidings calls our attention to the following item taken from an issue of The Reader's Digest:

"I don't care whether it is a business association, a labor union, a political party, or a church—all are guilty of the sin of talking to themselves. Democrats attend Democratic meetings, Republicans turn out for Republican rallies, union members go to their meetings, and the business people attend theirs. They all usually invite and applaud speakers they already agree with, and the speakers feel gratified because they evoke hearty applause. But nobody has had his opinions challenged, nor his beliefs questioned."

The Nebraska editorial continues that there is plenty of evidence that beekeepers follow the same pattern in their meetings. If anything of a controversial nature is mentioned, those in the audience seldom say anything about it until they are back home. It is not suggested that we take brass knuckles to our meetings, but that a free exchange of opinions is a healthy condition. Let's quit advertising to ourselves!

This is excellent thinking. We spend too much time telling ourselves that honey is Nature's finest sweet rather than influencing its use by the consuming public. We have spent far too much time talking to each other about the value of bees through pollination in the production of more than fifty food and seed crops. We have spent far too much time criticising the work of industry organizations without supporting them or doing anything constructive to benefit ourselves and the industry. Let's quit advertising to ourselves—an excellent idea!

Use of Honey Bees in Alfalfa Seed Production

The above is the title of 12-page circular 876 of the U. S. Department of Agriculture, written by G. H. Vansell of the Davis (Calif.) bee station.

Honey bees are becoming more and more important for good seed yields of alfalfa owing to the disappearance of wild bees both through destruction of their nesting places and the use of poisonous sprays.

Factors affecting seed yields besides pollination, are: control of insects and plant diseases, soil moisture and fertility, weather conditions, alfalfa varieties, methods of harvesting and plant competitors for pollinating services.

A moderately dry soil is desirable for alfalfa. Sugar concentration in the nectar is thus increased. Other conditions being equal, the more bees the more seed, although there is a limit where nectar produced declines as the colonies per acre are increased. More attention should be given towards a proper balance by remuneration of the beekeeper when more than a colony or two to the acre is demanded for larger seed yields. Rental and cooperative types of agreements are gradually being evolved. The studies were made largely over western areas.

Some "Vital Statistics" in Honey Marketing

by L. F. Childers

HOW do big financiers get BIG? Or coming closer home, how do big farmers get BIG? Wouldn't you expect a successful financier to know all the quirks of investing and reinvesting his earnings in top paying securities? And the farmer to plant the best paying crops on his richest land and to invest the surplus in other likely ventures? On these premises I wonder how we producers of chunk comb stack up? As one gets around the markets and sees the wide variation of packs and especially their retail price, one wonders how long before this form of selling is run squarely into the ground. No criticism is offered here as to the quality of the honey or the neatness of the pack. To date all that has been superb. What really needs sober consideration is the price it retails for. In my locality two big wholesale houses and two large producers are offering and selling chunk honey in glass at the same price as extract honey without comb. Here is a situation that needs correcting.

I believe it will correct itself when producers learn how to value their comb and also learn some of the avenues of loss in packing this honey. Let me call attention to one other condition here at the start. This is a small business. One suited to producers with fifty to one hundred colonies. Believe it or not, a big producer can't find time to cut, fit and recondition sugared honey that comes back and look after his other outfits. With this off our chest I am going to ask all us little fellows to sharpen our pencils and pull our chairs up. Let's figure this out: Two things we will first have to settle. One — If any given part of our outfit can produce say one hundred pounds of extract, how much comb could we reasonably expect it to pro-

duce if given that job? I believe the universal opinion would be one half. On that score the price of comb should be double the price of extract plus the foundation and one other item to be discussed later. The next question is what is the value of extract? This is my method of settling on that. I go into the largest stores in one or more towns and get the prices on the quality of honey I have to sell, and comb is never packed in any but the highest quality of extract. Chain stores operate on about 20 per cent profit and independent stores and the IGA's at 25 per cent, sometimes 33½ per cent. So if 20 per cent or 25 per cent is added to 100 per cent and divided into the retail price, the result will be within a cent or so of what the retailer is paying for the honey. The wholesaler operates on about 10 per cent but we need not go back of the first division since we are going to take the wholesaler's place. Taking the price of the jar and label off will reveal here in the Midwest a relative standard of 20 cents for a pound of extract honey. Now I hear a lot of chairs rattling, but we well know that in locations where there is more honey than people it will sell for less and where there are more people than honey, it will sell for more.

In my territory two pound jars of filtered extract are selling for 59 cents in chain stores and one brand

of our best extract by a sizable mid-west packer is also selling at 59 and 62 cents for the two pound jars, in independent stores. While this price is being asked for extract, patrons of the two wholesale houses above mentioned are retailing two pound jars of the nicest kind of white honey with one half pound of comb at the same price — 59 cents. It is this condition on which I wish to center our attention. The amount of comb in these jars is approximately one half pound. To get that, a half depth frame of comb is cut in three long strips, then two cross cuts and the result is nine pieces approximately one half pound each. One piece of this, with one and one half pounds extract in a 6 cent jar with a 1 cent label, adds up to 57 cents. Then two other items about which no enthusiast has ever written must be added to this. One is the waste in trimming. This is much larger than one realizes. One hundred perfect frames from ten supers should cut nine hundred pieces. But no one ever gets more than 700 pieces from such frames. Among imperfections, there are the outside combs half sealed, some with feather edges, some with pollen cells, burr combs, two colors of honey, just one thing after another that can't be put into glass. A two comb loss is two ninths; twenty-two per cent; over one fifth of our forty cent honey that gets into the scrap can. Half of that can be re-



trieved as 20 cent honey, the other half as bee feed. The money loss is about 7½%. The other loss comes in the amount that sugars on the grocers' shelves. My experience is that about one dozen in every ten gets returned for reconditioning. For a one hundred super job, this would be no small item. Suppose we examine one dozen of these jars. We set them in a vat or a washbowl, throw in a generous handful of powdered soap and fill to the jar shoulders with water. While it is heating, we scald out the honey tank, strip off the sides of an apple box and with the extension bit bore holes sufficiently large to admit the mouth of our jars for a drainboard, then with the honey thoroughly melted, we take a pan of cool water in one hand to dip our "boiled" fingers in after lifting each jar out of the hot water. When the chip of wax can be lifted off, we drain the jars, then sneak back into the wife's kitchen and swipe that brass looking S.O.S. stuff she scours pots and pans with, then after filling our mouths with hay or something to keep us from saying things we huff and puff to get that boiled wax off for no one ever melted comb honey of this kind that didn't get a film of wax on the water. With the jars cleaned, we put in another half pound of comb, and fill it with liquid honey that already has one half pound of melted 40 cent honey in it, then screw on a new 2 cent cap and stick on a 1 cent label, then add 1 cent per pound reselling charge. Added up, it's \$5.40. Just 7 per cent of the value of the original ten dozen. So in getting at the real value of our pack we will have to add 15 per cent to our 57 cent jar, making 65 cents as our asking price. Then the grocer to get his 20 or 25 per cent will have to mark it at 80 or 85 cents to the consumer. I imagine I can hear a lot of shouts "Too high! too high!" But let us leave that for a moment while we study what happens to the fellow that is supplying the wholesaler with 59 cent honey. 'Ere this, it will have been noted that a pack of one half pound comb and one and one half of the extract is in the ratio of one to three. To get one hundred pounds of comb, we will have to put two hives to producing it while three hives will produce the necessary three hundred of extract. The way we figure (comb at 40 cents) each of our comb hives will earn \$20.00 and each of the extract colonies also \$20.00 with extract at 20 cents. Now if I am too high, what can you say about the

fellow that is supplying this 59 cent honey? To get the naked value of his honey, we will first strip off the retailer's profit of 25 per cent which leaves 47.2 cents; then take off the wholesaler's profit and this leaves 43 cents; now deduct 7 cents for the jar and label which leaves just 36 cents that he actually got for his honey. Now if the half pound of comb in it is worth 20 cents that would leave just 16 cents for one and one half pounds of 20 cent extract or it would figure out \$10.66 per hundred. Taken the other way around, deducting 30 cents for the extract, that would leave just 6 cents for his half pound of 40 cent comb or \$12.00 per hundred for the labor of two of his very best colonies.

But someone will rise to say that 36 cents for this jar is 18 cents a pound for honey and that is good money. So it is. But wait a minute. There was 100 pounds of 40 cent comb in this pack with 300 pounds of 20 cent extract that sold for \$72.00 when it should have sold for \$100.00. There was then a loss of \$28.00 which absorbed all of the earnings of one colony and \$8.00 out of another one. In other words this loss was seven twenty-fifths or 28 per cent out of every such couplet of five colonies used in a pack like this. Can one sustain such losses and stay in business? Is it not a fact that the selling end of any business is more important than the producing end?

All of the foregoing is the owner's lookout. The real damage is in a broader field, for whoever packs and sells chunk comb so it can be retailed at the same price as extract is educating the consumer to the idea that there is no difference in honey, that one can be produced as cheaply as the other. Then when someone does ask a proper price, they will come at him with, "There is a guy selling us honey cheaper than that and if he can produce it that way, why can't you?" That not only breaks the market, but flattens the morale of every other packer of honey.

Suppose we put our hats on and cross the street to this Big Super IGA store and have it out with its manager. The big super business is only his ego. The IGA part is what we should know about. The letters stand for Independent Grocers Association, some more big talk instigated by a bunch of wealthy producers, processors and distributors of food products. They and their kind really control the foods that are on our

tables each day. Their agents have rounded up one or more merchants in good centers to get a tacit agreement from him to handle only their goods in his business. If the manager happens to be a young man whom the company is carrying from month to month, he will likely turn us down. But an older man who has bumped his way up through the ranks will more than likely give us ear. We show him our sample. His eyes sparkle for he appreciates fine goods and knows there is in this pack a splendid sales appeal. Almost immediately comes "How much?" You say 65 cents. "Hm!" And he mumbles something about too much. He gives us a little chatter and we think his mind is on our sample. It is no such thing. He is sizing us up. Any salesman must make two sales before his goods are sold. The first sale is himself. So this to us is our supreme moment for the success or failure of our season's work is determined by how we handle ourselves in the salesroom. Of course, we will have left our cigarette outside and have on clean clothes, not necessarily fine, but clean, and what we say will be in clear concise statements. While he is fingering that sample, he will be fidgeting around 'til he gets behind his desk. He will pull out a long IGA list and run his finger around until he finds honey. Then he will begin to sing "Too high; too high; outa line; outa line; gotta get down; down; way, way down! Why I can buy two pound jars from \$4.75 to \$5.20 a dozen (that is about 40 cents to 43 cents each), and here you are asking me 22 cents to 23 cents more than I pay and 15 cents to 18 cents more than I sell it for." (His \$4.75 honey is his cheapest grade.) Now what can we say to a man that comes to us with an array of figures like that? Here is something to remember. There are scarcely any merchants that know anything about the production of honey. They don't know how extract is produced; that there is a division of labor in the comb builder's hive; that the flavors of honey are in the comb; that the bees themselves create a fifty per cent spread in the comb and extract produced. So we have some telling argument to present for our price. We will say, (1) that we too can fill jars with extract so he can sell them at 43 cents to 46 cents each, but one can't put comb in it and sell it for that. Now why? You will continue, (2) that the fellow who produces ex-

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Breeding Improved Honey Bees

IV. Inbred and Hybrid Bees

by William C. Roberts and Otto Mackensen

U.S.D.A., Agr. Res. Adm., Bureau of Entomology and Plant Quarantine

MANY beekeepers have produced excellent queen daughters of imported stock or daughters of some selected queen that they obtained from other beekeepers. The new stock queens usually mate with drones of the beekeeper's own stock. If the sex alleles of the two stocks are different, the eggs from most matings are high in hatchability.

The new stock may also be genetically different from the stock that the beekeeper already has. Thus the queen daughters of the imported queen produce hybrid progeny after mating with the drones of the beekeeper's own stock. These may be racial hybrids or hybrids between strains of bees. Such queens often produce excellent colonies with high-quality brood. The beekeeper then praises the imported stock apparently without realizing that his own drones contribute half to the genetic make-up of the workers in these superior colonies.

The story is often quite different after a few generations of backcrossing to the original drones or to drones produced by the hybrid daughter queens. Segregation and recombinations occur, and in the third or fourth year the queens and their progenies are frequently more variable than the original stocks. By this time the beekeeper concludes that the original imported stock was not so good after all or had "run out"; so he gets some other new stock for breeding purposes.

By this procedure the colony superiority may again be restored to a high level. It also falls again after a few years. To keep the quality of his bees up, the beekeeper continues to get new or different breeding stock every few years.

These results are best explained as due to hybrid vigor and the crossing of stocks having different sex alleles. The first-generation colonies were superior because they were hybrids—that is, they were headed by cross-mated queens whose worker progeny were hybrids between the imported and local stocks. By

mathematical analysis of the action of genes in future generations of segregation and recombination after outcrossing, it can be shown that by selection alone the beekeeper is powerless to keep this stock at the high level of production and uniformity exhibited by the first-cross progeny.

Most of the complicated physiological characteristics, such as egg production and vigor are dependent for their maximum expression on the harmonious interaction of many genes and their alleles. Since these genes are located on many chromosomes and there is linkage of genes on the same chromosomes, the likelihood that certain factors conducive to vigor will be linked with injurious factors reduces the chance of obtaining maximum vigor by selection within inbred lines. Moreover, in breeding within a line the sex-allele problem again arises and selection is considerably weakened by a high proportion of low viability matings.

In plant and animal breeding it has been found that certain hybrids are superior to the lines from which they are produced. The superiority of hybrid corn is unquestioned. Animal breeders have also obtained superior hybrids. Because a large proportion of the progeny is required for breeding purposes to maintain the lines, animal breeders have not used hybrids for extensive production. However, in hogs a modification of the controlled-hybrid program is often used. This is the crisscrossing of three lines, using hybrid sows and purebred boars in each generation. The three-breed crossed pigs are more productive than those of the pure breed. Hybridizing inbred lines of chickens has become more popular and profitable within recent years.

Hybrid vigor is generally thought to be a characteristic of dominance. Dominant genes tend to have more favorable effects than their recessive alleles, and in a hybrid the dominant genes find expression at more loci than do the recessive alleles. If one inbred line is dominant (AA) at one locus and recessive at another

(bb) and another inbred line has the reverse (aa and BB) characteristics, the hybrid will have one dominant gene at each locus (AaBb). If both loci contribute to vigor, then the hybrid will be superior to either inbred line. It is also thought that certain genes contribute more to vigor in the heterozygous than in the homozygous condition.

An ideal breeding system is the production and maintenance of purebred but unrelated lines and the crossing of these lines for the production of superior hybrids. Not all—in fact, only a very few—of the inbred lines will give outstanding hybrids when crossed. The breeder, however, can perpetuate those lines that nick favorably for the repeated production of superior hybrids.

Plant breeders can take advantage of hybrid vigor because of the large number of seeds produced in each generation and the relatively low cost of producing seed for the production of hybrids. Animal breeders, on the other hand, are not in this favorable position. The expense of producing and maintaining highly inbred lines together with the small number of offspring makes this practice unprofitable, except with chickens and to some extent hogs.

Honey bees more nearly approach the condition existent in plant breeding. Less than 1 percent of the daughter queens and drones of a queen is needed to perpetuate the line. Whereas only 4 to 10 queens are needed in each generation to insure the continuance of an inbred line, 3 or 4 outcrossed queens can be used to produce 10,000 hybrid queens.

The low cost of producing and maintaining inbred lines of bees, together with the large number of offspring that can be produced from a single breeding individual, suggests that a bee-breeding program based on hybrid vigor is practical. The effect of the sex alleles on egg hatchability further indicates that other breeding plans, such as line breeding, are slow and expensive be-

cause too many poor-viability matings occur.

To produce hybrid bees the bee breeder may cross different races, strains, or inbred lines of bees. Unless these bees are homozygous for the desired characters, the resulting hybrids will be variable. Furthermore, other crosses of the same races or strains will differ from each other. A sure method of having uniform hybrids is to have strains homozygous for the desired characters.

The fastest method of increasing homozygosity in a line of stock is to inbreed. Inbreeding is the mating of closely related individuals, such as parent-offspring, brother-sister, or cousins. Related individuals are likely to have many of the same inherited qualities, and mating of these individuals tends to fix these qualities in a homozygous, or pure, condition. Inbreeding is used chiefly for the one purpose of producing homozygosity, or genetic likeness of offspring.

Inbreeding within a population tends to separate the population into many distinct families. Each family becomes uniform within itself but distinctly different from other families. Selection between families of such inbred lines can then be made with more accuracy than selection between individuals. This is especially true for characteristics of low heritability, such as egg production and vigor.

The inbred individuals become lower in average merit than non-inbreds. They are not nearly so vigorous or productive. Inbreeding is the severest test of the heredity worth of the individual that can be made, for it causes fixation of both good and bad traits.

Because of the mating habits of bees, it is necessary that all inbreeding matings be made by artificial insemination. After highly inbred lines are obtained it is necessary to control matings to insure keeping the stocks pure. Artificial mating is the only safe method known at present with bees.

If the breeder makes very close matings, such as mother-son, brother-sister, or backcrossing to a queen, he can accomplish very little by individual selection. It is true that he can accomplish a great deal when selecting for color or other visible characteristics that are highly heritable. However, most of these characters have little economic importance. Characteristics of greater importance, such as brood produc-

tion, vigor, or resistance to disease, are not visibly detectable in individual queens or drones. Selection for these traits is more effective after the lines are inbred.

To determine traits in inbred lines, crosses are made to a line or lines known to possess certain inherited qualities. Thus the test of inbred lines for characteristics of low heritability is to cross all inbred lines to certain "tester" lines and compare the unknown inbred lines with each other. Selection then is between inbred lines.

The mathematical consequences of the various systems of inbreeding have been worked out by several authors. Kalmus and Smith (1948), Crow and Roberts (1950), and Polhemus, Lush, and Rothenbuhler (1950) have reported on the various systems of inbreeding possible with honey bees. The formulas of Crow and Roberts can be used to determine the inbreeding and relationship coefficients of stocks of bees.

Before beginning to produce inbred lines the bee breeder chooses the stocks that he will use. He may desire to cross two or more of the selected noninbred stocks before beginning to inbreed.

He should obtain a few queens each from a large number of sources and test all queens for one season under uniform conditions in a single yard if possible. In this way he can get first-hand knowledge of the potential breeding stocks. He may select some colonies for immediate inbreeding and perhaps allow the others to cross freely for use as future breeding stocks.

It has been shown in both plant and animal breeding that the best hybrids usually come from crosses of unrelated stocks of different origin. The breeder should therefore select a number of different types of bees. He should select some black, some yellow, and some queens intermediate in color rather than all of one color type. He should also select some long, slender and some short, stubby queens. He should obtain some gentle bees and perhaps even one or two lines with a lot of evil temper!

The superior hybrids are genetic heterozygotes. They are the result of crosses between stocks that are unlike genetically. Differences in type, color, or temper denote genetic differences for these characteristics and probably also for other characteristics that the breeder cannot readily see or measure.

There is some evidence that gen-

teness in bees is dominant over viciousness. In one of our experiments the hybrids of a cross between a vicious and a gentle line were gentle rather than vicious. The vicious line may bring into the hybrid the few genes that mean the difference between an average and a superior hybrid bee. By no means are we suggesting that we need viciousness in bees. This is merely an illustration of how genetic diversity might be obtained.

Once the stocks are chosen, close inbreeding is begun to fix the lines. The breeder should know which matings to make to obtain the desired inbreeding in the shortest time with the least expense. Figure 1 shows the percentage of inbreeding obtained in successive generations by the various systems of inbreeding possible in honey bees. The percentage of inbreeding is the percentage of heterozygous loci of the original selected individuals that become homozygous by inbreeding. Inbreeding has no effect on genes already homozygous in the lines; so we are concerned only with those genes that are not homozygous. Since the bee breeder cannot tell which genes were originally heterozygous and what effect each gene has, he can only measure the increase in purity of the stocks by the percentage of inbreeding.

With present techniques the two systems of mating that increase inbreeding fastest, backcrosses to a male and a mother-son, are not advisable economically. Loss of breeding individuals, and consequently of inbred lines, is high when these systems are followed.

The next most rapid method of increasing inbreeding is by brother-sister matings. This system is recommended, because at present it is the most practical of all systems shown. For the first two generations the systems of brother-sister and aunt-nephew matings and backcrossing to a female are identical in percentage of inbreeding. Because the aunt-nephew system depends upon the use of only one drone for each mating, this system is not so dependable for insuring the survival of an inbred line. Using only one drone to inseminate a queen often results in a poorly inseminated queen, who may turn into a drone layer before the next generation is produced.

Because drones mature more slowly than queens, backcrossing to a female produces inbreeding to 37.5 percent faster than brother-sister

mating in time consumed per generation for the first two generations. Thus backcrossing to the original queen for the first two generations followed by brother-sister matings in all future generations is recommended for the production of inbred lines in the shortest time with the greatest chance of success in maintaining the inbred lines. Multiple drone matings may be made in all generations to insure good inseminations.

The bee breeder should know what inbreeding will do to his stocks. If he starts an inbred line by backcrossing and then makes brother-sister matings as illustrated in Figure 2, he may expect that each line will become more uniform as inbreeding progresses. Most noticeable, however, for the first few generations will be the quality of the brood.

If queen B, a daughter of A, is mated to several drones that are sons of A, the egg hatchability of queen B will average 75 percent. A daughter of queen B, queen C, mated to sons of queen A will have egg hatchability that will average either 75 or 50 percent. If her egg hatchability is 50 percent, the line has been reduced to two sex alleles, and queens D, E, and F will also have eggs of 50-percent hatchability if mated as shown in the figure. If queen C has egg hatchability of 75 percent, then D may also be 75 percent but somewhere not far from E or F egg hatchability will probably drop to 50 percent and all future generations will remain at that level. However, by selection it is possible to keep egg hatchability at 75 percent, but the breeder would be reducing the effectiveness of inbreeding slightly by selection against certain alleles. It is advisable to select the 50-percent egg-hatchability matings in the C or D generation and thus quickly reduce all inbred lines to two sex alleles, so that they will also have 50-percent egg hatchability. If this is done, an analysis of the sex alleles is more readily accomplished. By test crossing to identify the sex alleles in each line the breeder can then predict which crosses will give high egg hatchability in hybrids and which crosses will give intermediate or low egg hatchability.

Other than improving egg hatchability, the bee breeder can accomplish very little by selection while inbreeding. He can select queens and drones in each generation for color and general appearance, but selection for most other characteris-

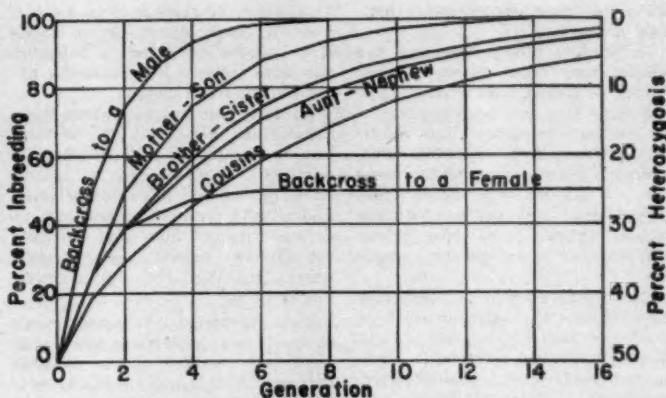


Figure 1. Percentages of inbreeding and of heterozygosity (assuming the initial value to be 50 per cent) in successive generations of various systems of inbreeding in honey bees. (From Crow and Roberts, 1960.)

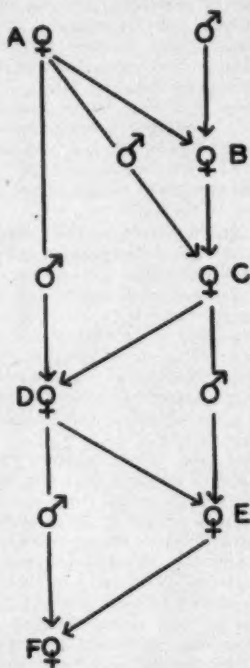


Figure 2. Arrow diagram of a recommended system of mating for inbreeding in bees. After two generations of backcrossing to a selected queen, the line is continued by brother-sister matings.

tics will be very inefficient.

In one season of inbreeding it is possible to produce a number of sister queens of the D generation and mate them to their brothers (drones produced by their mother queen C). These queens will be wintered, and the following year the breeder can make test crosses while

continuing to inbreed the lines by brother-sister matings. It is advisable to test-cross the inbred lines at the E generation of queens (50-percent inbred). Brother-sister mating should be made each year after the first to insure continuing the inbred lines until they are selected in hybrid combinations.

Since egg hatchability in inbred lines with two sex alleles is only 50 percent, the inbreds do not develop colonies with sufficient populations to permit accurate evaluation of such economically important characteristics as honey production, swarming tendencies, and wintering. However, such qualities as tongue length, wing length, and temper may be measured in inbred workers. It is also possible to select for such characters in the queen as size and number of ovarian tubules. This selection in inbreds as inbreds is supplemental to rather than a substitute for selection between inbred lines when in crosses with other inbred lines.

All crosses should be made artificially and the colonies tested under environmental conditions as nearly uniform as possible. The various hybrid crosses will differ, but the individuals of a given hybrid will be uniform as a group.

After it has been found that the colonies having (line 3 x line 4) hybrid queens mated to drones produced by (line 1 x line 2) hybrid queens are superior in production, then the breeding stock to produce this four-way combination can be distributed for commercial production. A commercial queen producer then needs only two artificially mat-

ed breeder queens from the breeding source to produce several thousand hybrid queens.

One of these breeder queens is used to produce daughter queens that will head the 50 or more drone-producing colonies necessary to supply ample drones. An inbred queen of line 1, artificially mated to drones from inbred line 2, is the mother of the hybrid daughters needed to furnish drones. Since drones are produced parthenogenetically, those drone-producing queens can be naturally mated to the drones of the

breeder's own stock.

An inbred queen of line 3 artificially mated to drones from inbred line 4 is used as the breeder queen. Her daughters will be hybrids (3x4). These virgins are naturally mated to drones produced by the (1x2) hybrid queens. The honey producer receives (3x4) hybrid queens mated to (1x2) drones, and the worker offspring in his colonies will be four-way hybrids—(1x2) x (3x4).

The test queens produced at Kelleys Island and distributed by the Honey Bee Improvement Coopera-

tive Association are produced in this manner. In the last article of this series we will describe the methods and practices used in large-scale production of four-way hybrid bees at Kelleys Island.

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Bowers Wins

Ira Bowers, White Hive Apiaries, Decatur, Illinois wins the Governor's Trophy (held by daughter Imogene) for best dressed booth; and Dadant Trophy for best display, at Illinois State Fair. Several items about this are quite worthy of comment. The tilted mirror at the top has the effect of duplicating and enlarging the display; nice embellishment of floral decoration too all through. The honey is top class, abundant, well arranged; model bee yard and building in front is unusual. Note the pedestals of honey and candles that revolved and were lighted with electric lights. Photo of granddaughter in center front was on the cover of the *Journal* for February, 1950.



First Prize

York Interstate

Outstanding first prize exhibit by Quay Minnich, of Red Lion, Pa., at the York Interstate Fair (York County Agricultural Society). The brood combs in both of the hives were especially beautiful. The whole exhibit has unusual symmetry. Horticultural Hall, in which this one placed, had over 10,000 exhibits. The Society had its first fair in 1851 and has continued with them each year since, except 1918. The fair is one of the largest in Eastern United States with fine buildings and facilities. According to electric eye clocking over 200,000 passed through this one building, Horticultural Hall, during the 1950 fair.



A Leader Passes and a Period Ends

by G. H. Cale

WHEN the telegram came informing us that Dr. E. F. Phillips was gone, I was in the West. On return home the September Journal was conspicuously in the center of the kitchen table. There it was—Dr. Phillips gone!

For days now I have been faced with the task of telling about him with proper perspective. It is quite up to me to do it since he has been my lifelong friend. When Dr. Phillips was head of the Office of Bee Culture for the United States Department of Agriculture he gathered about him a group of men all of whom became warm friends—White, Snodgrass, Nelson, Demuth, Sturtevant, McIndoo, Casteel, Gates, McCray, Sechrist, Watson, Eckert, Rea, and others,—warm friends and devoted aids to Phillips.

The organization of the Office was based on a plan formulated almost alone by Dr. Phillips; its purposes and leadership took form out of the conceptions of Phillips and his staff. I shall ever be glad that I was one of that number until I came here with the Journal. It was odd that Demuth went to Gleanings at about the same time and that many of the others went to the universities and experiment stations and field stations. Or was it odd? I have always felt that Phillips' understanding of leadership in this industry was a masterful one.

Should I bring into this account all the detail of his accomplishments and honors? It would take all the space to do so. He developed in Washington the scientific work this industry needed; he then had his staff carry the fundamentals of beekeeping out to the rank and file of beekeepers; by beekeeping schools, publications, lectures, extension and field work. During the first World War, under his leadership, commercial honey production increased about 400%. The extension work among beekeepers begun then has since been continued in many states. All this took a drive and a persistence no one before or since has ever equalled.

Doctor Phillips wrote more than six hundred bulletins and articles, which often were translated into other languages. His book, "Beekeeping," is one of the fine beekeeping texts. His correspondence with leaders the world over made him a world leader. His students are now active in important phases of beekeeping in China, India, Union of South Africa, Czechoslovakia and Canada; they are in the schools of this country; in the science groups; in the extension services. His trips abroad made him actively familiar with beekeeping in Switzerland, Austria, Germany, England, Scotland, Yugoslavia, Cuba, Mexico, Puerto Rico, Hawaii, and Russia.

In 1924 Dr. Phillips became Professor of Apiculture at Cornell University, in Ithaca, New York; in 1946, Professor Emeritus.

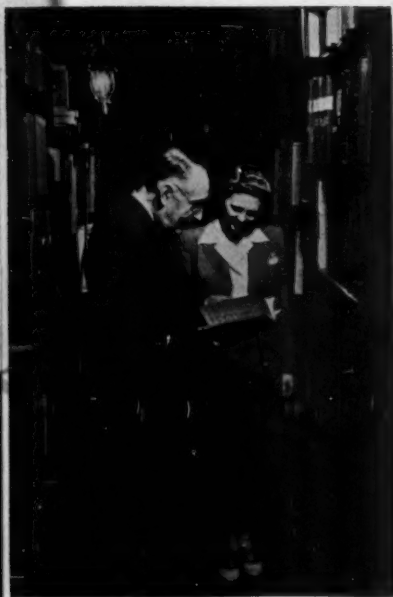
There was little break in leadership. There could not be. His grasp on beekeeping was too great and too well founded; his universal acceptance so solid. It is almost impossible to note the transfer from one place of activity to another. There was that about him that brought acceptance of his leadership. He was the center wherever he was. He fed his own greatness into those who sought him. Those who left his side took his fire with them and expanded it into their own endeavors.

At Cornell his great period of teaching flowered; his was a magic personality that expanded the minds of his students; excited them to contribute. The library of beekeeping at Cornell, named for him, now rests as one of the largest accumulations of apicultural knowledge in the world, perhaps the center, the pivotal point of his greatness, that future generations shall still feel his ever-remaining influence even though he is no more among us.

Should we write here of his three fine sons, each accomplished men in their own work; of his talented wife? I am sure they will not mind if all of this that I have to tell is confined to the father and husband.



Dr. Phillips as we remember him best during his period in U.S.D.A.



In the beekeeping library at Cornell, Phillips' fondness for books was outstanding. A book, to him, was a means of preserving the best the mind of man conceives.



Above, Prof. Wilson of Cornell pays the respect of that University to Dr. Phillips and his wife, at time of retirement. Below, Doctor and Mrs. Phillips and three sons.

However, since I was so very close to these boys and to Mrs. Phillips and to the home life of this splendid family, I should remark that few family groups are more accomplished or more fine as humans than this one. I should admit too that knowing them as I did, set ideals before me for my own family. And this is perhaps as apt an illustration as any of the profound way in which the effulgence of one man can find its way into the being of so many others.

Dr. Phillips was also prominent as a Rotarian, president of the Ithaca Club, District Governor, Chairman of the International Service Committee, director and vice-president of Rotary International. He traveled extensively in the interests of Rotary and became a leader in the social work of that order.

May I now reminisce? Born in 1878, Phillips was just enough ahead of us in years to be older and wiser, yet not so far ahead that he could not be one of us. Those of us who worked with him scolded him for his views, if we did not agree with him, without fear of offense. If he still thought us wrong he would show it



by action but not protest. He was a taskmaster but no more so with others than with himself. I can well remember how Demuth and I, in managing the Government apiary, often faced days with the "boss" when, by night, he was still fresh as a daisy when we were tuckered.

He worked without rest on anything he started until he had it done. Then he might "holiday" between efforts. Never was there a time, however when some other new task was not right at hand to capture his tireless energy. He liked best to do things which brought some new con-

cept into being; he wanted to understand so many things and to let others know about them. He would fight what he considered to be a misconception with unrelenting fervor. But, if he finally had to admit himself to be in error, he would quickly acknowledge it and champion that which he previously opposed.

Often in his office, we were worn out with drive and on one occasion, when Doctor Phillips was away a few days, we almost exulted. One brave person found a metal pan and spoon, with which he pounded away, until he imbued us with his joyous

relief from toil, and soon a line of happy employees hands on shoulders, were marching about the building, in wild abandon. When Phillips learned about it he promptly planned an office party and himself played with the rest of us.

To be sure, he is beekeeping's never-to-be forgotten leader; a firm friend to thousands many of whom do not know each other; into every corner of this land his vision penetrated; into all countries his influence extended. Farewell to our chief. May the future please give us more like him!

Colorado Marketing Agreement

Colorado has become the first state to put into effect a marketing agreement. The regulations apply to all marketable honey produced in Colorado and all colonies of bees, whether being used for honey production or for pollination. They were issued upon the recommendations of the Board of Control, which is composed of eight producer members and three packer members, and became effective July 1, 1951, after Paul W. Schwisher, Commissioner of Agriculture, issued three Marketing Orders.

The marketing agreement, according to John W. Holzberlein, chairman of the Board of Control, will give consumers a feeling of confidence that the jar of honey purchased from the grocer will be of acceptable grade and quality. It offers the opportunity to stabilize prices; can provide that honey is marketed in an orderly manner; and will increase the demand for honey through advertising in Colorado and adjacent areas which are normal markets for Colorado honey.

Other states should be interested in the details of the agreement and how it functions inasmuch as the industry needs better marketing methods and controls. What this agreement will do for Colorado honey producers, it can do for other marketing areas, and even the country as a whole since federal laws already are established which can provide marketing programs for agricultural commodities. It is an organized effort to improve the marketing of Colorado honey similar to those which have proven very effective in the marketing of other commodities such as Colorado peaches and potatoes.

To provide funds for administrative and other expenses, each beekeeper is assessed ten cents a colony and other funds are provided by the State of Colorado. Recently, \$3000 was granted to the Colorado honey industry by the State Publicity Committee for advertising purposes.

The marketing agreement provides that honey containers be labeled, for the protection of the consumer, with the grade standard of the honey contained. Rigid grading rules have been established which conform to U. S. Grades for Extracted Honey. Three color grades have been selected: Colorado Premium Grade having a Pfund reading of 0 through 16 which includes water white and extra white honeys; Colorado Fancy Grade having a Pfund reading of 17 through 34 (white honeys); and Colorado Golden Grade having a Pfund reading of 35 through 50 (extra light amber honeys). All honeys falling below the foregoing three grades are to be classified as "Industrial" honeys and must be sold as such. All honeys of the first three grades must pass the qualifications of U. S. Grade A.

The use of the word, "Colorado," is optional but if the word is used, all honey in the container must have been produced in that State. The words, "Packed under regulations of the Honey Administrative Committee and the Colorado Department of Agriculture," also appear on the labels, which are furnished in a different color for each grade to enable consumers to recognize the grade readily.

Although the Board of Control has voted not to require price posting for the present such a plan offers the opportunity for price stabil-

ization. Under such a plan, producers would inform the manager what their selling prices were, and other producers could find out by calling the office of the manager. Such a plan cannot be called price-fixing inasmuch as any producer can still sell at any price he chooses.

Otto Pfretzschner has been hired as manager of the Colorado Honey Administrative Committee on a part-time basis. He has wide experience in cooperative marketing and distributing of milk and dairy products. The committee or Control Board presently consists of: John W. Holzberlein, chairman; L. R. Rice, L. E. Mills, A. F. Coffey, John Haefeli, Grover Turner, Ivan Hansen, Vernon Culhane, T. L. Ball, N. J. Bullock, and L. P. Morris. The last three are handler or packer members while the first eight are producer members.

The Board met recently to plan how best to use the \$3000 which has been made available for advertising of honey. The American Honey Institute is cooperating with their efforts by supplying selling helps and other aids. Although starting in a limited way and perhaps cautiously, the Board has many plans for increasing the sale and consumption of honey in Colorado and their normal marketing areas. One proposal is to attempt to interest the College in preparing honey recipes suitable for high altitudes.

Colorado is to be congratulated in this move which will be watched with interest by many states, especially those with marketing agreements underway. The industry hopes that their efforts will be as successful with honey as those with other agricultural commodities.

Preparing Colonies for Winter

Robert N. Tweedy, writing in the *Irish Beekeeper* recommends sending colonies of bees to the heather. While the surplus secured is the usual purpose of such moves, Tweedy says: "The predominant advantage of migration to our autumn harvest is not the possible surplus, but the prolongation of the queen's laying period during the additional flow. Stocks which have been taken to the heather come out of winter hardier and with a larger number of young bees than those which have remained at home all the year."

And that might apply anywhere the world over with certain provisions. It must be recognized, to make the most of such fall flows the beekeeper must have been experienced enough to make sure that the queens then in those hives are not worn down by one or two seasons of prolonged active laying and likely to be superseded when the following spring opens. The bees may do much of their own requeening as the queen gets old and

worn, but we had best not rely on the bees doing the best job of it. Such replacing of queens for the fall flow is especially important when the bees have already gone through one or more heavy honeyflows which have taxed the egg capacity of the queen.

Of course the ideal condition, providing the queens fill the above requirements, is to have in your permanent locations a diversity of fall honey flora which, while not sufficient for a remunerative surplus, will provide stores for the winter rest period.

This we consider one of the main goals of our late editor Frank C. Pellett. He was ever searching for plants which might be added to the picture, preferably as principal sources of nectar but not forgetting that minor sources are also important at every season, be it for carry-over between flows, for spring buildup, for rearing young bees for winter, or for the fall larder for the winter cluster.

Predicting Honeyflows

We have already written in these pages of the competition felt in Great Britain from Australian honey imported into the British Isles. The *Bee Craft* for August calls attention to the fact that the average production per colony in Australia ranges in the neighborhood of 100 pounds or better annually, while 25 to 30 pounds is the overall average for Britain and 40 to 50 pounds for North America.

Part of this may be due to the fact that honey production in Australia is more the occupation of specialists with very few amateurs or smaller beekeepers to help bring down the average per colony.

Nevertheless the *Bee Craft* contends that there they have some twenty or more varieties of eucalypts in the country following each other rather closely, which makes for easy moves from one crop to another and a more nearly continual flow during the nectar season.

However, even the eucalypts do not yield invariably. Such being the case, experiments were conducted by Miss G. Wykes, (1948-

1950) to endeavor to find a solution to variation in flows and to determine whether fairly accurate predictions might be made on possibilities of a honeyflow, thus aiding the beekeeper in determining whether a move of colonies to new fields was justified. With full cooperation of beekeepers Miss Wykes made tests of the sap of these trees of many varieties. Apparently there is a relation between the amount of starch in the eucalyptus sap previous to approaching flow, and the intensity of flow to be expected; the more starch in the sap the greater the possibility of a good flow. While such tests are by no means iron bound, yet they are sufficient to be a help to the Australian beekeeper in moving from one eucalypt to another for succeeding flows.

Here might be a fertile field for investigation and effort, particularly in those parts of North America having even conditions of moisture and temperature at honeyflow time, for instance, the irrigated sections. The whole field of the effects of soils and weather on nectar secretion still remains almost unexplored.

Some Things Worth Knowing About the Use of Cyanogas

by Irving Kenyon

ONE of the handy things that has come into use in the bee-keeping industry in late years is the use of cyanogas for destroying bees or other insects that we want to get rid of. Cyanogas is something that we do not use very often and so we do not have enough experience as to how to handle it in the most safe and efficient manner.

The handling of cyanogas can be a very dangerous thing but if we understand a few things about it, there is nothing to be feared in using it. I am writing this to try to correct some of the erroneous instructions given out to prospective users. This advice comes from people not having had much experience with it.

It looks to me as if their fear of the killing effect of the gas was greater than their knowledge of how the gas works. I, too, had this dread of the killing effect by hearing a Farm Bureau agent tell how to use it to destroy woodchucks. Yes, I was scared about the stuff. When I started to work as a bee inspector the first place where there were bees to be gassed I was scared. The boss in our crew opened a can of gas and went along the rows of hives and gassed those that were marked for destruction with as much unconcern as though he were dusting insect powder on bushes. I soon saw that the element of fear was humbug if one knew how to handle this gas, and I have found out over a period of years, using hundreds of pounds, that it can be very dangerous if the person using it does not heed some things they should not do. I have known of cases where it caused death to the user because he used it in the wrong way.

I am going to tell you how I use this gas and what I avoid when using it. I remember one person telling how to use the gas. He said to take a teaspoonful and throw it against the hive entrance and then run. If it were used in this way I would say that it would affect the colony very little. It might kill a few bees that were just outside the entrance and

that is all.

First, I want to say a word about opening the can that the gas comes in. This gas is a gray powder when fresh and comes sealed in a tin can with a tight friction top seal. As soon as this powder is taken from the can and allowed to mix with air, it generates a deadly gas, so when we open the can to take out some of the powder, we should use caution not to bruise or get the friction top of the can out of shape as if we do, air can seep in and that will tend to cause the gas to degenerate. I think a good way to open the can is to use the hook end of a hive tool and raise the cover a little and then turn the can around and raise some more until the cover is loose. This should not mar the cover.

Now raise the cover and take out as much gas as will stay on the hive tool and put this in the entrance at one side and carefully move the hive tool toward the other side of the entrance trying to dust the powder evenly all the way across the entrance. If you don't think you have enough powder across the entrance put on a little more. Put this dust well inside the entrance. While you are doing this, pay no attention to the direction of the wind and keep on breathing as usual. The bees will die but you will not from the effects of this gas. I have probably seen this done several thousand times with no harm to the person using the gas.

You can go along to as many colonies as are to be gassed with no more danger to yourself than there would be if you were hunting queen bees. If the colony is strong and is hanging out on the front of the hive and you are killing the bees to eradicate American foulbrood, you should first place some papers on the ground in such a manner that they will catch the bees that are clustered on the outside of the hive where they fall, and be sure that these bees are burned. These dead bees exude a tiny drop of honey

when they die and if this should be diseased honey, it could cause more trouble if other bees borrowed it. Now dust gas over the bees hanging out. When they have fallen you can then get at the entrance and give them another shot. This is a strong colony so the gas that you put in at the entrance will soon be covered up by the large number of bees that will fall on the gas. If this happens, and it is quite likely, push the dead bees in farther and put in some more gas. In a strong colony like this, it will hurry things if after the bees at the entrance are stupefied, you can pry up the cover but not enough so a bee can get out. Now take another dose of gas on the hive tool, lift the cover quickly, and put in the gas, replacing the cover immediately. These bees will be dazed but could fly if you leave the cover off too long.

Now to help to remove some of your fear of this gas, I knew of a case where a man was going along a row and he gassed the wrong hive by mistake. He saw what he had done right away and he then pried off the supers and pried the hive body from the bottom board and stood them all up endways where the fresh air got to them and in about one hour the bees were all right, but might have wondered what they had been drinking. With old bees or a small colony, the gas works much faster.

I wouldn't buy cyanogas in cans that are larger than one pound. If you have some left over from a previous year and it has turned to a brown color, I would take it to some spot where no one was likely to be for 30 minutes and then I would take the cover off and throw the box away.

Now a word of caution, don't use this gas in a building or outside where the air is shut off by other buildings. I have been caught three times where I got the effects of the gas and you get quite a headache.

New York

Making Up Our Winter Loss

by Lee R. Stewart

WHEN we read of the beekeeper sitting in his office gazing out into the cold upon a group of nuclei over electric heaters which he hopes will take care of his winter loss as well as increase, we are reminded of two cardinal characteristics of all beekeepers: always planning for the future, and willing to try anything. We are spurred by a third famous characteristic: always wanting to tell how we do it. We are tempted to do that very thing in regards to the way we take care of our winter loss or make increase.

Each season we operate about fifty queen-rearing nucs. These are standard five-frame hives just a little wide in order to allow easy manipulation of frames, as a slight jar could send a nervous young queen skyward. The bottom board is nailed to the hive, the entrance is adjustable, and there is an inner cover and metal top. When the nucleus is first established, or at any time needed, we use four frames and a feeder. This feeder is a pine 2x6, the same length as a frame with its center bored out and cleats nailed on the ends for frame rests. This is the only nonleakable feeder we know of, a very important item in a nuc's life.

We keep several of these nucs in each yard, using good swarm cells and overcrowded colonies to stock them. If these sources do not supply the desired number, we graft cells as soon as the weather permits. Replacements are supplied by graftings and purchases.

We consider these nucs to be the most important part of our outfit. In addition to supplying queens as needed, they furnish a queen reservoir and are ideal for special and experimental queen matings. They do not require the constant care the baby nuc does, yet they require more bees and more equipment. But since standard frames are used this is no drawback. If one of these nucs is

neglected you need not worry about it absconding. If it gets too strong you can use the sealed brood to strengthen some other colony or set it over into a standard hive and run it for honey production. Nucs started in July have produced a super of honey and a strong colony for winter. They are also excellent for drawing combs and storing feed for other colonies. They make a fine storage for poor combs weeded out from our regular colonies during the season.

The important thing in a nuc's life is adequate feeding at the proper time. Of course they must be fed lavishly to store feed and draw combs. When there is no nectar available they must be fed, and often when nectar is available they must be fed, as they do not always have the field force to gather it. Many beekeepers make the mistake of thinking a nuc can make its way if a strong colony does, when in fact a nuc may starve in a yard that is storing a surplus. Many nucs starve or make no progress without feed between honeyflows. We feed sugar sirup, half and half in cool weather and a little thinner in hot or warm weather.

At the end of the season our nucs enter upon the second phase of their life. Regardless of how careful we have been in keeping all colonies headed with good queens, each fall we find some that are worn out. It is amazing how good a queen will look today only to be a sad-looking, forlorn wreck on the morrow. Our nucs are used to replace these queens. We simply kill the old queen and unite the nuc via the newspaper method to the old colony. If this makes a larger brood chamber than we want we remove, in a few days, enough of the lighter combs to reduce the colony to a desirable size. If we care to avoid this second operation we remove combs at the time of uniting.

After all poor queens are replaced and weak colonies strengthened, we still have nucs remaining which we winter over to make up our winter loss and for increase. This is done by selecting strong colonies and screening both top and bottom of the escape hole in the inner cover. We add another rim of the same size on top of the old rim; in other words, we just double the rim's depth which gives us the proper bee space beneath our combs. On one side we leave an opening in this added rim just large enough for a drone. We put a little alighting board at this entrance which we like to have facing south or west.

Next we set an empty hive body on this inner cover which is still on the strong colony. Then on a cool day or late some evening we gently set nuc frames into the empty hive over the strong colony, being careful to leave the comb arrangement as it was in the nuc and placing the brood nest over the screened hole in the inner cover. We finish filling the hive with combs of honey and pollen, being careful to place well-filled combs of honey next to the brood nest. The hive is closed and the seams between the two hives are sealed with tape to keep out any cold wind as it is too late for the bees to seal them. The heat from the strong colony below keeps the nuc above warm.

In the spring, after danger of all freezing is over, we set nucs off on stands of their own, either for increase or to strengthen weak colonies. In the latter case it is better to unite the weak colony to the nuc. If you want to push the nuc, give it a frame of sealed or hatching brood from some strong colony, being careful to brush all the bees from it. These nucs will build up rapidly if they have plenty of honey and pollen and will produce as much or more than your standard colonies.

Indiana



From the Honey Plant Test Gardens

by Melvin A. Pellett

Melvin follows in his father's footsteps at the Test Gardens. His wife, Betty, is also much interested in this project so ably established and conducted by Frank Pellett. A grandson, Harold, just about equals his parents in enthusiasm. So we hope the Test Gardens will continue to delve into our needs for more and better pollen and honey plants.

A NEW addition to the test garden is a single plant of big-leaf cow parsnip (*Hieracium mantagazzianum*). This biennial plant, native to the Caucasus, reportedly grows to a height of up to nine feet and with flower umbels up to two to three feet across. It is reported from France as unusually attractive to the bees and a fine source of honey. The seed must be planted in the fall to come up about the following May. Some seeds were sent by M. Ryal, Meux, France which were planted in the test garden in November 1949. However, we had some unusually dry weather at the time for the seed to come up the following spring. About the time we had given up much hope of it starting, we discovered that we had one plant. At the time of writing, this plant is blooming. Possibly due to the struggle to get started, this single plant does not measure up to the full size reported from the old country, still it is remarkable. Succeeding flower umbels arise to make an impressive amount of bloom. We hope to have seed for further trials.

A plot of Ladino clover, where there is a scattering of white Dutch volunteering around the edges and in it, demonstrates clearly the comparison between these two varieties. Both are making lush growth this season. However, the leaves of the Ladino are much larger and the total growth is in the same comparison. There was some honey bee ac-

tivity on both varieties late this afternoon (July 19th). Observing the two varieties together impresses on one the importance of the source of seed, since the seed of white Dutch and Ladino are identical in size and appearance. For those who wish to grow pure Ladino, it is well to secure certified seed or else to know well the source from which the seed comes.

J. W. Newton, Baton Rouge, Louisiana, offers us a bit of seed of red clover variety which has volunteered near one of his apiary sites. We are informed that for all he knows this may be nothing more than the common red clover; yet the bees are visiting it and from a single plant to start with it has spread to cover a larger area. This from a locality where red clover is little grown, if at all, sounds interesting. Yes, Mr. Newton, we will be pleased to have the seed to try here. Although we have to try many plants in order to find once in a while one that may be some good, who knows, this might be just the one.

The Chapman honey plant (*Echinops spærocephalus*) began blooming the middle of July. The blooming date is a bit later than usual, as is that of most plants this season, due to the cold spring and cool weather continuing through June. The globe shaped flowers are the size of golf balls and larger, comprised of many florets. One evening at 7 P. M. there appeared to be nearly as

many bees present as there were flower heads in bloom. The bees are greatly attracted to these flowers.

This season we have had lots and lots of rain through April, May and June. And on our rich Iowa soil, when we get ample moisture, how plants do grow. We must again trim back some of the shrubbery along the drive, so the farthest reaching branches will not scrape cars coming in. We have been sitting on the front porch speculating on which of the lower growing tree limbs should be removed so that we can see out. We think plenty of trees make for ideal surroundings in which to live, but it does take some effort now and then to keep from becoming completely enclosed in a thicket.

We have an interesting note from O. S. Persing, Prince George, B. C., Canada. He reports winter temperatures dropping to 30 and 40 degrees below zero and states that his plots of both Pellett clover and bird's-foot trefoil, started several years ago, are doing well there. I believe it is the New York Empire strain of bird's-foot trefoil he has.

At most observations this season, the bees are working freely on bird's-foot trefoil and their actions clearly indicate a yield of nectar. This is a long lived pasture legume and all indications are that it will be much more widely planted for that purpose in the wide area to which it is adapted. We have much yet to learn

about the value of bird's-foot trefoil as a honey plant. Reports so far indicate that this may vary much according to locality. It is reported from southern New York State as being visited by bees only for pollen; from northern New York and Vermont as a source of surplus honey, and from Minnesota as the source of a major honey crop. Here, the bees work it much more in some seasons than others. We are eagerly awaiting further reports on the nectar yield of this plant as it comes into production in new localities. It is reported as almost wholly dependent upon insect pollination to set seed.

We might speculate on how much relatively small areas of early blooming honey plants contribute to honey bee colony strength, to the perpetuation of wild bee populations and finally to the pollination services for the locality. It seems almost certain that this would be in proportion far greater than the area devoted to the early honey plants. Honey plants might well be considered for a definite part in most conservation programs, with the emphasis on those which bloom before, in between or after the main honeyflows. An aid to beekeeping is also an aid to pollination.

We have a small field of Ohio evergreen sweet clover now in bloom. This has made a very thick heavy growth and will add much humus and nitrogen to the soil. I cannot stand on the ground anywhere in the field and with arm extended upwards, reach the ends of the higher terminals (perhaps a tall man could). This variety is especially noted for its long blooming habit.

The use of blue lupine is expanding rapidly in recent years in southern states, largely in Georgia, Florida and Alabama where it is used principally as a winter cover crop for soil improvement. We would like more information regarding the nectar potential of this crop and hope some of our readers will enlighten us. Several varieties of lupines have been tried in the test gardens. But so far, neither the growth of the plants nor bee visitations give much encouragement for their use in this section. "American Honey Plants" mentions some of the wild lupines as yielding pollen and some nectar in parts of Colorado, Texas and Pacific coast states. We will appreciate if some who have apairies near fields of lupines will advise whether or not the bees work it.

October, 1951



Above: The big leaf cow parsnip, July 6, 1951. Below: Flower umbel of the big leaf cow parsnip (*Heracleum mantegazzianum*).



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Fall Selling Helps

American Honey Institute
Madison 3, Wisconsin

There is time for one final message to the consumer before the beekeeper closes shop for the winter. October winds should stir up a renewed enthusiasm for honey sales. Look at these ideas to push your honey:

Feature your honey with fall foods. Suggest hot milk sweetened with honey as an after-school drink. Perhaps adults would prefer hot cocoa or hot coffee with a honey taste. A steaming plate of pancakes smothered in honey is an inviting cold-morning breakfast. Give your customers a chance to enjoy a Honey Apple Crisp as a fall dessert by passing out this recipe:

Honey Apple Crisp

- 4 cups sliced apples
- 1/4 cup sugar
- 1 tablespoon lemon juice
- 1/2 cup honey
- 1/2 cup flour
- 1/2 cup brown sugar
- 1/2 teaspoon salt
- 1/2 cup butter
- 1/2 cup walnuts (if desired)

Spread sliced apples in a shallow baking dish, sprinkle with sugar and lemon juice and pour honey over all. In a bowl mix flour, brown sugar, and salt, and work in the butter as for biscuits, making a crumbly mixture. Spread these crumbs evenly over the apples and bake in a moderate oven (375 degrees F.) for 30 to 40 minutes, or until apples are tender and crust crisply browned. Serve warm, with plain cream, or whipped cream topped with a dash of powdered cinnamon.

This is only one of the many fine honey recipes you will find in the Lemons and Honey booklet published by the Institute.

Laud your honey as a year-around food. Don't sell honey short by over-emphasizing its goodness as being a summer treat. Honey is good and stays fresh and tasty the year around. Be sure your customers know it. With this in mind, you might start planning your selling campaign for the winter months. Gift packages of honey attractively wrapped are a big success at Christmas time. Valentine's Day offers a most unusual chance for you to sell well-packaged honey under a slogan such as "Give your Honey honey." With the good supply of honey that nature so kindly gave to beekeepers this year, such a year-around selling technique should be used by every beekeeper who desires to make beekeeping pay.

Give your honey a special wrapping for the fall season. Perhaps a

different cap, perhaps a sticker to place on the container will do to identify your honey as a fall food in abundant supply. Stickers in the form of rust and yellow leaves, for instance, will give the customer the idea you want to pass along. And on the sticker you could print: "Fall honey at a reasonable price."

Offer a special on honey, complete with large display posters and a large group of honey jars. Never try to attract attention with an exhibit that is skimpy or poorly arranged. You must have honey present in large quantities before the American public (which is accustomed to having things done in a big way) will pay attention to what you are doing.

Renew your efforts to make the public honey-conscious by sticking close to your advertising program. Advertising has proved its worth to many a retailer. Honey men who have undertaken extensive advertising programs have come up with results that would make even the most skeptical, believers.

We want to emphasize one important consideration here: Make sure your product lives up to everything that your advertisement says of it. False advertising is fatal; the customer will not fall for the same gag twice. But if you tell him your honey is pure, and it is pure, then you have established yourself as an honest and reputable man. So don't make exaggerated claims for your honey. Just repeat the simple unadulterated truth that honey is sweet, pure, golden, and unique in flavor, and you will get far better results from your advertising.

Play up the different flavors of honey. Like ice cream, like jello, honey, too, comes in different flavors. Instead of letting one flavor compete against the other, it is far wiser to have one type of honey supplement the other. Buckwheat honey, clover honey, cranberry honey, alfalfa, orange, or cotton honey should all be marketed under these names. Never apologize to the consumer for these more unfamiliar types of honey; on the contrary,

play them up as something unique and desirable. Once the consumer has tasted these flavors he will want more.

Don't neglect the recipe leaflets and books published by the American Honey Institute. They are an excellent way to show the housewife how to use honey the year around. The small cost of these leaflets to you is more than amply repaid by the honey customers they will gain for you. We know of one beekeeper who keeps a list of all his honey customers and regularly sends them a honey booklet from the American Honey Institute. The return requests he has for his honey are astounding. He claims that this great acceptance of his honey is due largely to the excellent recipes in the leaflets.

The Institute has only one purpose in mind. That is simply to help the beekeeper. We have found that through these recipe leaflets we are able to offer a service to the beekeeper that he could not otherwise afford for himself. This system of printing recipe leaflets in quantity to get cheaper printing rates, then selling them back to the beekeepers for what they cost us to print them, is extremely successful. Beekeepers daily use this service to their best advantage.

Keep up your support of the American Honey Institute. Nothing is quite as important to the independent beekeeper as to know that he and his honey are represented in the stiff competition between foodstuffs. The American Honey Institute carries the responsibility for representing the American beekeeper at conventions of food people, advertising parleys, and in getting space for honey in newspaper, radio and television programs. For over twenty years this service has been going on. Beekeepers reap the benefits from it without full knowledge of the groundwork that is being laid for them by the Institute.

The work of the Institute can continue only if the support of the beekeepers continues. Up to date, more and more beekeepers have climbed on the band wagon by sending in their contributions to the Institute.

At the beginning of every year the Institute publishes a membership list which is distributed to each member. You will want to make sure that your name appears in this booklet. By sending in your contribution, you can reserve a place for your name now.

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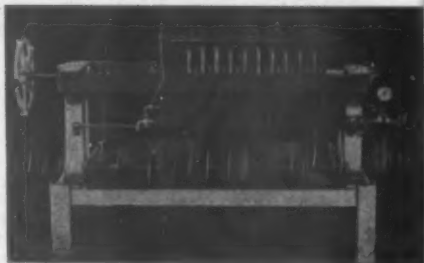
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Prolific, good winterers,
GENTLEST OF ALL
RACES OF BEES

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Albert G. Hann Glen Gardner, New Jersey



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You Asked Us - -



This year I hived a captured swarm and since it was small I gave it four frames of honey left over from last year. These frames had been stored in a shed. This colony is not doing well and we wonder if the honey we gave them was spoiled. Flies are attracted to the entrance of this hive, the bees are not active and act drunken and stagger. There is no brood.

Fred Harmor, New York

The honey that you gave this colony is probably not causing the trouble. It could be caused by several things. They may have Nosema disease, as bees with this disease are sluggish and sometimes will crawl around on the ground outside the hive and tremble. They do not build up into strong colonies. If it is Nosema, try moving the hive where it will get plenty of sunshine and requeen the bees. A booster package of two or three pounds of bees with queen might help too.

Or the bees may have been poisoned. Sometimes they work blossoms that have been sprayed with poison spray. Poisoned bees act very much like those with Nosema. They will finally become paralyzed. If you send a specimen of bees and brood to the U. S. Bee Culture Laboratory at Beltsville, Maryland they can diagnose what is wrong. It would not be wise to unite these bees with another colony until you know definitely what is wrong.

Near one of my apiary sites in the foothills there has been a bad fire that burned about eight thousand acres of purple and black sage. I have been thinking very seriously of hiring an airplane to reseed some of this area. I would like to use black sage and wild alfalfa or wild broom seed. Can you make any suggestions for other types of seed that would do well in our semi-dry area.

W. Terzenbach, Calif.

The most promising plant for sowing on your burned over range is another sage from northern Europe. It is the meadow sage (*Salvia pratensis*) which is a very promising plant for this area. However, it would be something of a gamble since we do not have sufficient information regarding its behavior in California. There are not many good honey plants within reach for such a purpose as so little seed can be had in most cases. Mustard seed should be available in quantity, however. On lands where the clovers and bird's-foot trefoil will succeed the chance is better since commercial supplies of seed are within reach.

How can I tell a young queen from an old one? Also how can a beekeeper determine if there are enough bees in a hive for successful wintering?

J. F. Clarke, Iowa

Old queens of one or more seasons have more slick backs, while young queens have a sort of down on their bodies. One learns to tell an old queen from a young one by watching them. A young queen moves faster over the combs and lays full frames of brood, while old failing queens are slow and lay patches of brood. However, most queens curtail brood rearing in the fall to conserve on stores. Keeping a check or record of your colonies will help you to know when queens are old.

To determine whether or not there are enough bees in the hive for wintering you should examine them when the weather is warm and the bees are spread out. They should cover more than eight frames of comb in a single hive body. A colony with only eight frames of bees is considered weak. Colonies may be requeened any time that the old queen is failing, and weaker colonies may be united with stronger ones in the fall to go through the winter.

I wish to kill off some of my bees this fall so as to buy hybrid stock in the spring. When should the old queens be killed?

Roy F. Rider, Montana

When killing bees in the fall, it is the best practice to kill the queen a little before the end of the honeyflow, but if there is a doubt as to how long the flow will last the queen should be caged so that the bees will not rear a new queen. It takes about three weeks for all of the brood to hatch and therefore the queen should be caged from two to three weeks before the end of the flow. When the brood has all hatched out the bees can then be treated with cyanide gas and thus easily disposed of. It might be better for you to simply winter these bees over and then replace the queens with hybrid queens in the spring. By requeening as early in the spring as you can get queens from the South, the colony would be entirely changed over in time for the honeyflow and the hybrid queens would have had time to get in some good work.

Most authorities seem to agree that cutting out the drone comb in the hive will reduce the number of drones. How could this be? A drone is the product of an unfertilized egg. Can the queen determine whether the egg she lays will be fertilized or unfertilized?

Clyde B. Lewis, W. Va.

If the bees have drawn a strip of drone cells at the bottom of a comb, and the rest of the comb contains worker cells, it will do little good to cut the strip of drone cells out. The bees would only draw out more drone cells to fill out the frame. But if the whole comb is cut out and foundation installed in the frame, the bees will likely draw out only worker cells if the foundation is good grade and extends down to the bottom bar.

The belief is that drones are hatched from unfertilized eggs. The queen bee is the only female that we know who has control over which type of egg she will lay. How she does it is an unsolved mystery but she does do it. As we know, worker bees hatch from fertilized eggs. The egg that produces the worker comes in contact with sperm from the drone with which the queen has mated. The queen can evidently withhold or release the sperm at will, which makes the egg she lays either unfertile or fertile.



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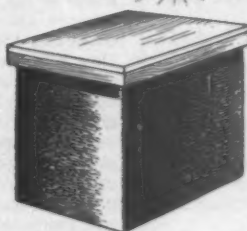
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Requeen your colonies with the queens developed on Kelleys Island, Ohio.

We have recently received new breeder queens and plan to have queens available all Fall.

Do not confuse these queens with other Hybrids. Specify Kelleys Island 3-Way Hybrids.

Prices for balance of season — 3-Way Hybrid or Regular stock postpaid.

1-26	-----	\$1.00 each
26-100	-----	.90
100 up	-----	.85

We wish to thank our many customers for the nice business given us this spring. If you were pleased tell others, if not tell us. It is our desire to please.

ROSSMAN & LONG

P. O. Box 133

Moultrie, Ga.

How - to - do - it

Smoker Fuel . . .

I had been using burlap bags and sometimes shumac bobs for smoker fuel, but one day last summer I ran out of both and cut up some old rope into short pieces to fit into the smoker. It worked so well that I have used rope ever since and find that it is superior to other fuel and lasts longer.

H. W. Wightman, New York

To Dispose of Poor Queen . . .

This is a British suggestion to get rid of a laying worker or poor queen as reported in the Bee World. Place an empty hive in a sunny spot behind the apiary. Remove all combs with adhering bees from the hive containing the poor queen, brush out remaining bees and close hive entrance. Insert in this hive a frame of drawn comb and release a new queen and her attendants on that frame. Then brush off all bees from the removed frames into the spare hive at the back of the apiary and quickly return the frames to the original hive, placing them on each side of the frame with the new queen. Close the hive and open the entrance. The bees will find their way back into the original hive and you can then find the poor queen in the empty hive and destroy her.

R. A. vanderPyl, Illinois

Save the Last Drop . . .

A method of saving the last drop of honey from cappings and odd scraps of chunk honey might be of interest to other small beekeepers. Tack a piece of ordinary window screen over the bottom of an empty super and cut a hole in the center of the screen to correspond with the hole in the inner cover. Remove the hive cover and the block from the center hole in the inner cover, and place a queen excluder over the inner cover. Place the super with the screened bottom over this and pour in enough cappings from which most of the honey has been drained or which have been whirled partly dry in an extractor, to cover the screen an inch or so deep. Leave the hole in the center open. The bees get the honey which drips through the screen and work the top of the cappings through the hole in the screen.

The cappings should be given only late in the afternoon to prevent robbing. In a couple of days the cappings will be dry and the bees will have saved the honey in them.

Kenneth Brogdin, Tennessee

How NOT to Do It . . .

DO NOT winter bees on light-colored combs. Dark brood combs are far superior and bees will winter in them much better.

E. F. Bea, Minnesota



Division Board Feeder

The picture shows a division board feeder at one side of the hive. The feeder is just about the same size and thickness as a drawn comb and frame. Masonite bonded tightly on a wooden frame does well without the use of metal. The top lugs should be sturdy and sized to fit into the hive rabbet just like the frames. A copper wire screen strip is fastened to the ends of the lugs and sloped down to a center block at the bottom. This strip is tacked in before the sides are bonded in. The MD size feeder holds a gallon of sirup. It will also do for dry sugar feeding. It may be kept in the hive constantly if desired, it is easy to fill with a funnel can with little disturbance to the colony, and it will not encourage robbing.

Bottom Entrance in Winter . . .

Here is a suggestion for those beekeepers who prefer a bottom entrance only, in winter. Raise the back of the hive about $1\frac{1}{2}$ inches higher than the front and the bees will keep the entrance clear. No dead bees will accumulate on the bottom board. Use the shallow side of the bottom board during winter and leave an entrance $\frac{3}{4}$ inches high the width of the hive.

Julius Lysne, Wisconsin

Arsenic Poisoning . . .

Beekeepers have suffered great losses when cotton fields have been dusted with arsenic to combat boll weevil. Frequently colonies not entirely destroyed at the time of poisoning have dwindled and died due to arsenic dust stored with the pollen.

When Jesse E. Gooch of Pine Bluff discovered a yard of about 40 hives in this condition he resolved to do something about it. There were sufficient field bees remaining in the hive to protect the combs from wax moth. So he experimented with ways of removing the poisoned pollen and finally discovered a satisfactory method.

He dipped each frame into a tub of warm (not hot) water in which several packages of baking soda had been dissolved. The frames were left in the water 3 to 4 minutes to soften the pollen. Then he gently shook each frame to dislodge the excess water before replacing it in the hive. The frames containing sealed brood were subjected to the same treatment without injury to the brood.

On inspecting the hives four or five days later, Mr. Gooch found that the poisoned pollen had been removed by the bees. The queen was laying, the sealed brood was emerging insuring sufficient nurse bees, and the colony was well on the way to recovery. What at first seemed a total loss was a yard full of promise for the fall harvest.

Arkansas Apiary Board Bulletin, August 1950

QUEENS FROM the WONDER STATE
ITALIANS—\$1.00 each
Dadant Starline Hybrids
The bees of tomorrow
that you can have TODAY
\$1.25 each 100—\$100.00
Reared in large nuclei,
well developed.
Reg. U.S. Pat. Off. THEY PLEASE
S. J. HEAD Crosssett, Ark.

HIGH QUALITY ITALIAN QUEENS
By Air Mail, 75c each
10 or more, 65c each
CARLUS T. HARPER
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A CONSTANT MARKET FOR
YOUR BEESWAX
DADANT'S, Hamilton, Illinois

How Langstroth Began as a Beekeeper—

(Continued from Page 411)

He continued to work with his bees for several years, knowing he had made a forward step, yet not satisfied. If only he could in some manner obviate the necessity of cutting the combs loose before removing them from the hive, his improved hive would be a success.

One late afternoon in October he was returning home from his apiary. Absorbed in his reflections, he did not see the houses by the way or the carriages he met. It was a mood which occurred frequently. As he drew near home, he revolved in his mind the experiments in his little apiary, and his perplexing problem.

Suddenly he stopped in the middle of the street. He uttered a quick "Eureka!" Then, as suddenly as he had stopped, he resumed his pace, now scarcely able to restrain himself from running. His problem was solved. In a flash it had come to him, and he could see in his mind his hive in all its details. The combs, instead of being hung on bars, should be enclosed by frames, the frames so hung that there would be a space all about between them and the hive walls except at the tips of the top bars. The bees would have no place to apply their glue.

Before Langstroth went to bed, he drew a diagram in his journal, and after the date of October 30, 1851, he wrote, "By the use of such a compound bar, the removal of bars with brood, comb, or honey can easily be effected . . . A command over the whole proceedings of the bees is obtained which is truly wonderful."

On January 6, 1852, he filed a claim for a patent on his movable frames. It was the beginning of beekeeping as a serious pursuit.



Cook-Dupage County Beekeepers

The top photo shows Mr. A. J. Smith, secretary of the Cook-Dupage association, uncapping and extracting honey with a two-frame reversible extractor powered by an electric motor. This was very interesting to new members of the group. Below, is a shot of some of the members around the refreshment table.

These pictures were taken at the Cook-Dupage outdoor meeting held Aug. 12, 1951 at the home of A. J. Smith. Discussions at the meeting centered around the problems of a beekeeper, equipment, and honey handling.

Rudy Bryant, Chicago

Moving Soon? . . .

To make sure of receiving your copy of **AMERICAN BEE JOURNAL** promptly, please send advance notice of your change of address directly to us.

At least four weeks before change takes effect let us know:

1. Date you are moving.
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Clip the old mailing label from your **AMERICAN BEE JOURNAL** and send it in with your change of address to **AMERICAN BEE JOURNAL**, Hamilton, Illinois.

It's possible to have your mailing address corrected by filing your new address with the Post Office, which in turn will notify us. But if a copy of the magazine is sent before that notice reaches us, it means expense in forwarding postage.

New Zealand Honey Prices . . .

According to the Australasian Beekeeper, New Zealand beekeepers are now authorized to ask 9 pence per pound for honey delivered (ceiling price). In U. S. money this is equivalent to about 10½ cents per pound, which does not mean that all honey is now selling at that price, but does represent an advance over previous levels obtainable.

German Author Dead . . .

One of the most complete books on beekeeping today is "Unsere Bienen" a book of some 500 pages. It first appeared in 1920 and has since been revised. Its author, August Ludwig, died during the summer of 1951. He had written many treatises and magazine articles on bees during his long service to beekeeping.

Massachusetts Beekeepers Meet

On July 20, the Massachusetts Federation of Beekeepers Association held a very successful meeting. This was beekeepers' day during the University Farm and Home Week at Amherst.

A discussion of queen rearing by Dr. William L. Coggeshall of Cornell reviewed different methods and suggested that queens might be reared in the North as well as the South.

Due to the illness of Dr. Phillips who had been scheduled to speak, George Rea gave some valuable data on increase in seed production due to honey bee pollination. More data was given by Dr. Coggeshall.

Following a discussion of a proposed revision of the bee disease control act, Mr. F. E. Cole, Extension Specialist, spoke on honey labels. Some brand new ideas developed from this talk—better color on labels is needed to complement the honey, recipes or uses for honey might be included on the label, and use of the word "pure" to describe honey may infer to the public that there is impure honey on the market. The label should tell what is in the container, where it is from, and how to use it, Mr. Cole advised.

Other discussions included straining honey; conserving beeswax, led by H. H. Root; and Dr. Coggeshall's talk on bee diseases and their treatment.

The college apiary was visited during the meeting and a four-frame observation hive used for teaching purposes was inspected.

Elmer G. Carr, New Jersey

This is the Month

by Frank E. McLaughlin

Autumn is here again. Even though it's a beautiful time of year, the thought of winter just around the corner spoils some of the beauty for me.

Our good friend, G. H. Cale, has been enjoying a vacation for a few days. For such constantly loyal work with the American Bee Journal, along with his beekeeping, he was certainly entitled to some rest. Change of thought can do wonders for a man.

Our Western Missouri Beekeepers Association had their meeting on August 12 with a picnic and basket lunch. There were contests, games, and prizes. Everyone enjoyed the day very much. There were several other associations that met with us and we had some very good speakers.

I attended the Missouri State Fair at Sedalia on Sunday, August 19. The Missouri State Beekeepers Association had their meeting in the afternoon. In spite of weather conditions this season, there was a very nice display of honey, bees, and all beekeeping by-products. Considering the floods and bad conditions, the display was excellent.

Several times in my column I have recommended the Dadant Starline hybrid disease resistant bees. I would like to repeat a paragraph of a letter I received from one of my readers, Ed J. Baumann, Jr., of Edgar, Wisconsin.

"In one hive I have a Starline hybrid queen. They did not swarm, and have two and a half supers full of honey. I like these bees very much. They are easy to look at without getting them angry."

Removing Supers

It is about the time of year again for removing supers, full or empty, as the case may be. At any rate when the supers are ready for storing away until next season, the combs should be treated in some way to prevent the wax moth from damaging them. There are several things used for fumigating drawn combs. Most bee books explain the different methods that can be used. Care should be taken to follow directions on the product used to fumigate combs.

When removing supers, most everyone will find some frames partially filled. When possible, leave them on the colonies for stores especially if the honey is not capped. If the partially filled combs must be removed, they can be placed in a super and set on a colony during a dearth of nectar, with an inner cover between the hive body and the super of partially filled combs. The bees will carry the honey down. If the frames contain dark comb, a queen excluder should be used under the inner cover to prevent the queen from going up and starting a brood nest.

Wintering

I have had inquiries from some of my readers about wintering bees. I believe it is the proper time to discuss briefly both indoor and outdoor wintering. Unless the winter is too cold, I prefer to winter outside. It is my opinion that the bees do much better when wintered outside, except in locations where winters are very severe.

Whether wintering indoors or outdoors, the main thing to remember is to leave plenty of stores on the bees. That is very important. Along with a young queen and plenty of young bees, plenty of stores are essential to successful wintering. If a queen is old and starts falling in the fall, the colony may go into the winter with all old bees, which likely will result in loss of the colony the following spring.

I do not like too much packing. In the northern states it may be essential to pack. Here in Missouri I use one thickness of black building paper around the hives and leave top ventilation. Heavy packing seems to make an ice box out of the hive. On warm days when the bees could have a cleansing flight, the heat from the sun doesn't penetrate the heavy packing, and the bees do not fly as often as they might if lighter packing were used.

Top ventilation plays a big part in outside wintering. It allows moisture to escape from the colony, allows circulation of air, and will prevent the bees from suffocating in case the bottom entrance becomes clogged with ice.

Sudden changes are very hard on bees. On days when the weather warms up, the bees will move over to fresh honey. If a sudden cold spell comes, the bees are sometimes caught on empty combs, and will starve before the weather warms again.

Cellar Wintering

Some northern beekeepers winter in cellars. They use the method of removing the bottom board and tiering the hives up, one on top of another, sometimes three or four stories high with 2x4 stringers placed between each hive. This permits the dead bees and debris which fall on the lid of the hive below to be brushed out. This tiering up on 2x4 stringers also allows circulation of air through the hives.

Temperature in the building should be kept even at all times, maintained at about 45°. There should be some plan of ventilation which leaves the building completely dark. If even a ray of light shows, the bees will fly to the light, and as they cannot find their way back to their hive they will become lost and die.

I will be glad to help any of my beginner readers with their bee problems. Write me in care of the American Bee Journal.

Janscha on Swarming . . .

A fact little known by beekeepers generally is that Anton Janscha of Carinthia had known of and written describing an exact account of the fertilization of the queen bee, his book appearing first in 1775, before any of the blind Huber's writings were published.

That delightful British translator, H. Malcolm Fraser, gives us a critical survey of Janscha's "Swarming of the Bees" in a short 32-page book. It is delightful reading. This Janscha book appeared in 1771. The Apis Club is the publisher. We have obtained a few copies for our readers at 75 cents each, postpaid. We hope that some day, the larger Janscha book may be translated and published.

Alfred P. Johnson Passes

On August 12 at Elizabeth, Colorado Alfred P. Johnson passed away at the age of 53. He had been in failing health since 1937. Mr. Johnson was a beekeeper in Rankin, Illinois for 35 years. He leaves his wife, a son, a daughter and one granddaughter.

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All Around The Bee Yard

by G. H. Cale

The first real vacation in years kept me away from home a month. Time and distance are changed by physical and mental states; time is short when interests are absorbing and distance is reduced when time is fully occupied. Perhaps this interplay of space and hours is a part of what is called "relativity."

Since my wife and I were actually for once cut loose from all our ordinary moorings we were as people must be who set out in ships for unknown shores, adrift, not knowing what is ahead or when they might return. Home seems fine after a vacation.

The vastness of this country grows on one as he travels it. It does not seem far now to me from Canada to the Mexican border; nor from the Mississippi to the east coast. But if you go from the Atlantic to the Pacific the days pass through the close greenness and quiet country to the great river; then more days through the wide spaces, the mountains, the "deserts," until, finally, the Pacific stops the way.

Why do they call it "Pacific?" Signs say "Don't bathe here. Dangerous undertow." It is rocky, it is cold, it is foggy. The Atlantic may also be rocky, but it has wonderful beaches, and seems warm and soft hearted more often than otherwise.

In the intermountain valleys, along main highways, large bee yards are common; white and straight-rowed; piled with supers. At a small roadside stand in what was called the desert, a two-pound jar showed the honey to be a fine blend of clovers and alfalfa; perhaps "sage." Judging by the way the bees are hidden here at home, the fact that twenty-two yards of good size were to be observed on main highways in that country indicates that those not to be seen off the highways would add considerably to the number. Roads are not so plentiful though in these areas, so it may be the main ones have more of the bee population showing.

Here in the Middle West it is only occasionally that we find honey at roadside stands. In Colorado par-

ticularly, especially around Rocky Ford, honey signs at such stands are numerous. The honey is well packed and well displayed and seems to move well.

In one San Francisco market there is a unique honey booth, with large tanks of honey of different kinds, filled into containers at the customer's wish. The whole market is unlike any we have here since there are so many distinct kinds of foods that are out of the ordinary. One man, for instance, has all kinds of whole grains that are ground to the customer's order and he has no other products in his booth. There are so many novel ideas in selling there, that a good market man could well afford to pay his way that far to study things he might use back home.

At Memphis, Tenn., we found one stand devoted almost entirely to the sale of honey. It was large, and gravel drives gave space for parking. Lawn ornaments and pottery were offered but the stand itself was filled entirely with honey. Wherever there are large cities with a wide trade area with plenty of people moving about, stands like these should sell plenty of honey. The more imagination the owners put into their merchandizing, the more frequently customers come. Self-operated stands afford a wonderful chance to dispose of moderate crops at a profit and there is no end to the attractions that can be made a part of such sales displays.

Back home, the bees were found to be comparatively idle although there has been an abundance of fall honey plants in bloom; heartsease; more Spanish needle than we have had for a number of years; more white boneset; and the promise of plenty of "frost flowers," (fall aster).

We have been through other periods when abundant bloom has given little return. What the magic combination is that results in honeyflows no one knows. We have locations on definite soil types in the same county. Yards in the south of the area do not pay for their keep,

although the amount of bloom seems to be plentiful; while in the north of the county, on a different kind of soil but with almost no bloom to be seen from the roads, the crops are enough to make honey production profitable.

What young queens will do in producing young bees for winter has been emphasized this fall in making brood counts in our breeding work. The older queens reduce egg laying much earlier and brood is entirely emerged long before that of younger queens. Even with little flow stimulation some young queens were still laying 1800 eggs a day and the total will mean a fine lot of bees to go through winter. Queen testing and requeening, therefore, still remain a vital part of honey production. The kind of colonies one gets from such stock are the ones that will likely produce the larger crops in the year ahead.

We have found many ways to introduce queens at different times of the year, most of them apparently not generally used, and the trying and fitting we have done to better our introduction methods have in turn opened our eyes to other things we had not thought about previously. For one, the old advice that it is good practice to replace queens on a time basis (once a year or once every two years) is poor. Colonies frequently replace their old queens without swarming and at odd times, during the end of the honeyflow, in the fall, or even between flows. The queens so produced are often excellent; sometimes poor. The best way to requeen is by behaviour—when ever a queen does poorly, regardless of her physical appearance, it is time to replace her. Since we have used marking on queens, however, even when following this plan, we have at times removed old queens and given new ones, well marked, only later to find unmarked queens doing well in those colonies. The explanation is simple. We failed to note the presence of young, superseding queens in the very colonies being requeened!



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Milestones in American Beekeeping— (Continued from Page 412)

is difficult to believe it was responsible, to a very great extent, for the development of the beekeeping industry as we know it today. Our beekeepers use this principle with such casualness today that it is doubtful if many of them appreciate what Langstroth has given them.

Following the acceptance of this new improvement, the rapid growth of the industry was matched by an almost constant stream of further developments which continued to aid the field of honey production and colony management. Although all of them added much to the industry, few of them, if any, would have reached their present value had not that of Langstroth preceded them.

Comb or box honey came into popularity and in 1857, J. S. Harbison developed the comb honey section. It was improved upon by A. J. Cook in 1876 when he made these of basswood, and in 1879 James Farnbrook introduced the grooved one-piece section.

Beekeeping, and conditions within the industry, improved so rapidly that the first national association of beekeepers was inaugurated in 1860. At that early date, those interested in the industry recognized the necessity for organization—a point that is slowly being understood by many beekeepers who appeared on the scene almost a century later.

And, a year later in 1861, the first copy of a bee magazine printed in the English language rolled off the press. The American Bee Journal appeared on the scene and has been adding its contribution with each succeeding issue since that time.

Expansion of the industry demanded faster and better transportation of bees. After much discussion and legal controversy, the way was cleared to deliver bees through the mail, and in 1863 the first queens were shipped through this medium of transport.

Although the extractor was developed by Hruschka in Austria in 1865, Langstroth learned about it, and developed one along similar lines which was soon accepted with enthusiasm by beekeepers.

And, as a further indication of the times, attempts were under way to develop better strains of bees. This involved the use of elaborate equipment by which the mating of queens could be controlled. Success of the

attempts were not far reaching in themselves, but the efforts paved the way for more modern artificial insemination which was started in 1885.

Smokers of all types were being used. Until 1875, apparently no satisfactory smoker had been developed. Quinby improved the smoker at that time, placing the bellows beside the fuel container where we find it now. Bingham added a gap between the nozzle of the bellows and the fuel chamber in 1877.

Such small items! And yet so important—so significant!

The queen excluder developed in 1875 was followed in short order by successful attempts to graft queens, the first sales of package bees, and the earliest attempts at migratory beekeeping. Even the bee escape, which first appeared in the 1870's as a crude affair made of mosquito netting, developed into the widely used Porter escape which appeared in 1891.

The matter of wax foundation came in for its full share of attention. Many attempts were made to produce a satisfactory foundation. Johannes Mehring of Germany in 1857 was probably the first to produce it. A. I. Root further improved the process of making foundation and developed the idea of using metal rollers in 1876. D. S. Given produced wired foundation in 1879 although there is some question as to priority in this case since J. E. Hetherington introduced a similar product at about the same time and secured a patent on it.

What a stream of inventions were witnessed by beekeepers in the last half of the nineteenth century! Although minor improvements have been added since that time, modern beekeepers owe practically every piece of equipment to those ingenious men of the past. Further developments of the twentieth century have been fewer and farther apart, and tend to be more technical in nature.

The bacillus larvae of American foulbrood was isolated in 1903 by G. F. White which led to many processes whose goal was the control of the disease. The most recent is the practice of using sulphathiazole, discovered and developed by L. F. Childers and Leonard Haseman in 1944.

It is a matter of considerable speculation as to why improvements within the industry declined so

sharply at the close of the 1890's. Have we reached the ultimate of what can be done? Is there nothing further to add? Surely the American beekeeper cannot admit that his imagination and initiative has either been dulled or stagnated.

It is with open admiration that we view the work of these men who have gone before us. We are indebted to them to the extent of our industry. And yet, as is so frequently the case, the point that made it all possible was the utilization of a medium so common to all of us that it is given little consideration. Space! Space in a beehive that was first recognized by Langstroth, the Dean of American Beekeepers.

Long Season Pastures For Illinois . . .

W. L. Burlison in Circular 682 of the College of Agriculture at Urbana, Illinois writes of "Long Season Pastures for Illinois."

Recommendations for summer pasture are alfalfa, Ladino clover, alsike clover and Korean Lespedeza. Alfalfa makes excellent pasture the season following seeding. It is recommended to remove livestock from legume pastures during late September and October to allow the plants to store food material for the next season.

Burlison's tables of various grasses and legumes to use to make the seven-months pasture are interesting pastures as well as better bee feed.

Big Crop Crimson and Dutch Clover Seed . . .

Preliminary reports from Washington indicate record crops of crimson and white clover seed in 1951. About 123 thousand acres of crimson were harvested in the six southern states and Oregon with a forecast of 21 million pounds as against 16 million last year, with only 2,500 acres more of plantings in 1951 so the average pounds per acre runs considerably more.

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Market News

by M. G. Dadant

Crop Compared to 1950

Throughout the New England states, the honey crop probably will be in excess of a year ago, particularly in Maine and Vermont. New York conditions are quite spotty and the crop has not materialized to the extent first anticipated although the Hudson Valley and northern New York appear at least as good as last year, with western New York only average. Throughout the southeastern states, conditions are varied, with perhaps as good a crop as a year ago. Florida, particularly in the tupelo regions, is far ahead of last year and other sections are also yielding well so that the total crop should be in excess of 1950. Pennsylvania reports much more honey than last year, but the buckwheat regions are still in doubt owing to the weather. The South in general has had about an average crop, but this does not include Oklahoma and Texas where dry conditions prevailed and the Hubam clover was more or less of a failure, so that the total crop probably will not be over 50 per cent of a year ago. Late drought has hurt also. Arkansas is average or better; Missouri and Kansas report much less than a year ago; and even Ohio and some sections of Nebraska are not much above the light crop of 1950.

Earlier conditions indicated that all of the clover regions would have a bumper crop, but the damp and cool weather moderated this and conditions have been quite spotted. However, there is probably more honey this year in most sections except the ones mentioned above. Northern Michigan was especially good, Wisconsin perhaps better than a year ago, and Minnesota about average. Some sections of northern Iowa were better and other sections including Indiana and the Dakotas about average. In the inter-mountain territory, Colorado and New Mexico have been light, Wyoming and Utah above last year, Nevada and Idaho about average and Montana much better than last year although not as high as anticipated.

Washington and Oregon apparently are better off and California has a little less honey than a year ago.

All in all, it looks like the total

crop might equal or exceed that of a year ago, although fall reports are that bees will not make a great deal above filling up their brood chambers for winter.

Condition of Bees

Throughout practically all regions bees are in good condition, although Kansas and Oklahoma reporters indicate that feeding may have to be done because of the drought and failure of the later crops. Bees have suffered some in the cotton sections from poison, but all in all, the cotton situation has been better than a year ago with far better cooperation than formerly between the farmers and beekeepers.

Dry weather in Ohio has militated against bees gathering such stores as they might need for winter.

In Canada the honey crop in the eastern provinces of Ontario and Quebec is far in excess of last year, while Manitoba, Saskatchewan and Alberta report perhaps just a little less, and British Columbia somewhat more than a year ago.

Condition of bees in Canada is quite satisfactory.

Condition of Honey Plants

Honey plant conditions as a result of the generally wet weather throughout most areas indicate honey plants will go into winter in perfect condition. Exceptions will have to be taken, however, in the case of Minnesota where it is somewhat too dry, Oklahoma and Texas where dry weather prevails, and Colorado, Ohio and some parts of southern Michigan and Indiana.

In all the irrigated sections, there seems to be an average amount of alfalfa and sweet clover going into the winter.

We might mention in the southern areas that owing to the heavy cotton crop and somewhat of a reversal in the market, there seems to be a tendency to go back into legumes again in 1952 so that more than likely there will be more seed of crimson clover, vetch and Hubam clover planted than was the case for

the year just past. Naturally this would indicate more possibilities for beekeepers in those sections.

Is Crop Ready?

Naturally beekeepers with the relatively low prices of honey are trying to do all the work themselves, and as a consequence, the honey crop is slow in getting ready for the market, although in the southeastern states and the East generally, most honey is taken off except the fall crop.

In most sections, however, perhaps not over 50 per cent of the crop is off and ready for market, particularly among the moderate-sized producers. However, there has been enough honey available to take care of any demands and in fact, much is going into packaging for school programs and for government export.

Honey Prices

There is some indication that honey prices are starting about a half cent above last year and no indications that they will be below the support price of 10.1 cents per pound, except in the case of the uninformed beekeeper or the beekeeper who produces in less than carload lots and may be located at some distance away from a cooperative packer in assembling the honey. In any case, the smaller producer would be necessitated to carry his crop to the packer where carload lots could be assembled.

We have learned of honey in truck lots selling at 12 cents a pound f. o. b. producer. On the other hand, we know of one lot of a few tons in Illinois which moved at a price of 9 cents f. o. b. producer's point. All of this was for white honey. The general price tendency is about 10 to 11 cents, or right around the control price for white, with amber honey running 1 or 2 cents a pound less.

There is a decided possibility of better prices in Canada although one of the Canadian cooperatives is paying just $\frac{1}{2}$ cent more initial payment on the honey than a year ago when the initial payment was $4\frac{1}{2}$ cents. It has now changed to 5 cents. Suggested prices in Canada are from 14 to 16 cents for white honey, and from 9 to 11 cents for amber.

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QUEENS OUR SPECIALTY—Italians, 90c each; Carniolans, \$1.25 each; Caucasian, \$1.00 each. All queens shipped by Air Mail and guaranteed to please. Walter D. Leverette, Box 364, Ft. Pierce, Fla.

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SHORT'S QUEENS ARE GOOD QUEENS. Try them and you will find their colonies tops in production, gentleness and freedom from diseases. Three banded Italians only. Used by leading beekeepers for more than thirty years. Requeen now for maximum production next year. \$1.00 each; 10, \$9.00; 25, \$20.00. Postpaid. Prompt shipment. H. C. Short, Fitzpatrick, Ala.

CAUCASIAN BEES and QUEENS. Write for 1952 prices. Tillery Bros., Greenville, Ala.

THREE BANDED Italian bees and queens for 1952. Write for prices. Alamance Bee Company, Graham, N. C.

FOR SALE

FOR SALE—Electro Flo Filling Machines. Designed for honey. Fills containers automatically. Write for information or see in operation. Hancock Honey House, Hancock, Iowa.

BEES FOR LEASE AND SALE—Montana, Wyoming, Idaho, Nebraska. Contact Bradshaw & Sons, Wendell, Idaho.

IF INTERESTED in acquiring a 900 swarm money maker, contact A. E. Schuelke, Riverton, Wyoming.

TWO HUNDRED thirty double-story colonies of bees. Never any disease; best equipment. Roy Bunger, Council Grove, Kans.

FOR SALE—1 to 2000 No. 1, 10-frame shallow supers with combs at \$2.50 each. 500 California type tops and bottoms, new or in new condition, 75c each. Free from disease. States Apiaries, Saratoga, Wyo.

FOR SALE—Full sets (twelve numbers) American Bee Journal for the years 1913, 15, 16, 19, 1921, 22, 23, 1938, 37, 38, 39, 1942, 43 for \$1.50 a year while they last. Foreign postage 50c a year extra. American Bee Journal, Hamilton, Illinois.

FOR SALE—Complete bee business, modern and up-to-date, in the beautiful Flathead Valley of western Montana. More than 700 10-frame two-story colonies, hundreds of supers of combs, 19 registered and protected locations, new 40 by 80 two-story honey house completely equipped, water, electricity, truck with tailgate lift. Heart condition makes sale necessary. If interested, write for complete particulars. J. D. Harrah, Chario, Montana.

FOR SALE—21 colonies of bees, 10-frame size, 2 stories, all new. No disease. John C. Schroder, Rt. 4, Box 4425, Paradise, Calif.

ONE OF MONTANA'S largest apiaries and packing plants. State wide established market for all honey, 1600 colonies of bees and equipment, disease free. Building 60 x 140. Over 50 miles of registered locations. Write Ronald M. Brown, Box 72, Big Timber, Montana, for full information.

FOR SALE—Eight-frame Lifetime Superior extractor. Brand melter, 300 gal. tank, boilers and other extracting equipment. Floyd Goodyear, Boyden, Idaho.

45 STANDS OF BEES, equipped, 15 empties, 120 supers filled. Disease free. Charles M. Barker, Millersburg, Iowa.

Copy for this department must reach us not later than the tenth of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

Rate of Classified advertising—13 cents for each word, letter, figure or initial, including the name and address. Minimum ad, ten words. As a measure of precaution to our readers we require reference of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on comb must guarantee them free from disease or certificate of inspection from authorized inspector. The conditions should be stated to insure that buyer is fully informed.

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WANTED—Extra white and light amber honey. Let us ship you the containers. Sell us your honey for CASH on delivery. The Hubbard Apiaries, Manufacturers of Bee Supplies and Comb Foundation, Onsted, Michigan.

WANTED—Extracted honey, white or light amber, in 60's. State price in first letter. Ed. Heidt, 1004 W. Washington St., Bloomington, Illinois.

HONEY AND WAX WANTED. Mail sample. Advise quantity. Bryant & Sawyer, 2425 Hunter St., Los Angeles, Calif.

HONEY WANTED—All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 1380 Produce Street, Los Angeles, California.

WANTED—All kinds and grades of honey. Sample requested. Cole Honey Co., 4460 Piedmont Ave., Oakland, Calif.

WANTED—All grades comb and extracted honey, large or small amounts. Quote price in first letter. Mail sample. King Honey Co., 4308-10-12 E. Truman Road, Kansas City, Mo.

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COMB and EXTRACTED HONEY wanted. Truck or carload lots. Contact Victor Honey Farms, Josephine, Texas.

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HONEY—White extracted, mostly clover, in 60-lb. cans ready for bottling, 15c per lb. f.o.b. Louisville. Lose Brothers, 206 E. Jefferson St., Louisville, Ky.

NEW CROP OF HONEY shipped daily from producer in Florida. Pure orange blossom, 5-lb. pail \$2.25. Pure Florida cut comb honey, 5-lb. pail \$2.75. No C.O.D. orders; all shipments prepaid. E. E. Raley, Box 1610, Daytona Beach, Florida.

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MICHIGAN'S FINEST WHITE CLOVER HONEY. New sixties. Fully ripened and clean. You will be pleased. Sample, twenty cents. John McCall, Tecumseh, Michigan.

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GOOD QUALITY clover comb and extracted honey. Crawford Smith, Clayville, N. Y.

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THREE TONS light clover in 60's, some chunk comb. Roy Bunger, Council Grove, Kans.

HONEY FOR SALE—450-500 60-lb. in new can. White clover and basswood. Clean, no bees in. Sample free. Eli Elieff, Galena, Illinois.

FANCY CLOVER comb and extracted honey for sale in any quantity. Case Apiaries, Robert Case, 216 Bristol Street, Canandaigua, New York. Phone Canandaigua 533 R.

HONEY FOR SALE: Custom packing and processing. Truck or carload. Russell-Barnes Apiaries, Oakland, Nebraska.

SUPPLIES

WRITE FOR CATALOGUE. Quality bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies, Onsted, Michigan.

FOR CHRYSLER all steel electric welded queen excluders in the U.S.A. write to: Prairie View Honey Co., 12303-12th St., Detroit 4, Michigan. Ask for circular E. 2.

BEE SUPPLIES of all kinds. Write for free catalogue. Hodgson Bee Supplies Limited, 565-13th Avenue, New Westminster, B.C., Canada.

A 90 DAYS SPECIAL—Your wax worked into quality medium brood foundation for \$18 per pound. Reduction for large quantities. Hawley Honey Co., Iola, Kans.

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BEEKEEPERS NEEDING SUGAR for fall or spring feeding. I have 50,000 lbs. of good clean sugar. Will sell all or part at \$5.00 per cwt. Will take in trade white clover honey delivered Omaha. You can haul sugar back on return trip. Write John Tidewell, 2711 No. 63rd St., Omaha, Nebraska.

WANTED

HIGHEST CASH PRICES paid for 10-frame bottoms, covers 5% extracting supers, with or without drawn comb, in good condition. W. H. Woodworth, Nashville, Iowa.

WANTED TO BUY—Small apiary in Montana or Wyoming. Write Box 5, American Bee Journal.

WANT used bee and extracting equipment. Loren Miller, Greenbush, Minn.

WANTED—Standard depth 10-frame supers, frames, bottoms, metal top telescope covers, new material. Nealey Honey Co., Aberdeen, Idaho.

POSITION AND HELP WANTED

WANTED—Help to take off crop. Phone or wire Dr. Clark, Newell, S. Dak.

MAN WANTED to help in shop, queen yard and package bee production coming season, to take pay in bees and queens. Can supply livable house near work. No drinkers. Will pay fair wages. References exchanged. E. J. Head, Crosssett, Ark.

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MISCELLANEOUS

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KNOW interesting facts concerning the bees of India through the **INDIAN BEE JOURNAL**, published in English, by the Bhupen Apiaries (Himalayas), Ramgarh, Dist. Nainital, U.P., India, and obtainable from them. Subs. Rs. 7/- or 10 Shillings or \$2.25 per annum. Single copy Rs. 1/4 or 1/9 or 49 cents (international money order). Payment in mint postage stamps of your country accepted.

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Carloads and less than carloads. Mail sample and best prices in all grades.

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THOSE GOOD DARK ITALIAN QUEENS

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26 to 40	-----	.50 each
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QUALITY and SERVICE

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Navasota, Texas

Some "Vital Statistics"—

(Continued from Page 417)

tract sets the comb in a machine and throws the liquid out, then sets the comb back for a refill, and this can be repeated for as much as twenty times or more. But, (3) the comb producer can't do that for he cuts the comb out and the labor of building comb and filling it is carried on at the same time and so only half as many pounds of comb can be produced as of extract. Therefore it costs double the extract.

This is convincing information. If necessary, you can add, (4) that many consumers want comb because it imparts flavor to the extract. While you are making him this little speech there are two questions revolving in the back of his head that must be settled before he or anyone else can be sold. First is, will any of his customers pay such a price and if they don't, how can he ever recover his money? We beekeepers as honey salesmen forget that the merchant really does not buy our honey, rather it's his customers who buy it and he is only our agent in the matter. So we had better make a clean breast of it and say to him that we guarantee our product, that if it should get out of sales condition we will replace it. Now that puts a burden on us and as such it is our duty to pack the very best there is; to find if possible our customers' likes and dislikes of different kinds of honey and give them what they want. Your merchant will handle your goods as long as you see to it that his profit is coming, and he will pay in advance any price in reason that you put on it if you convince



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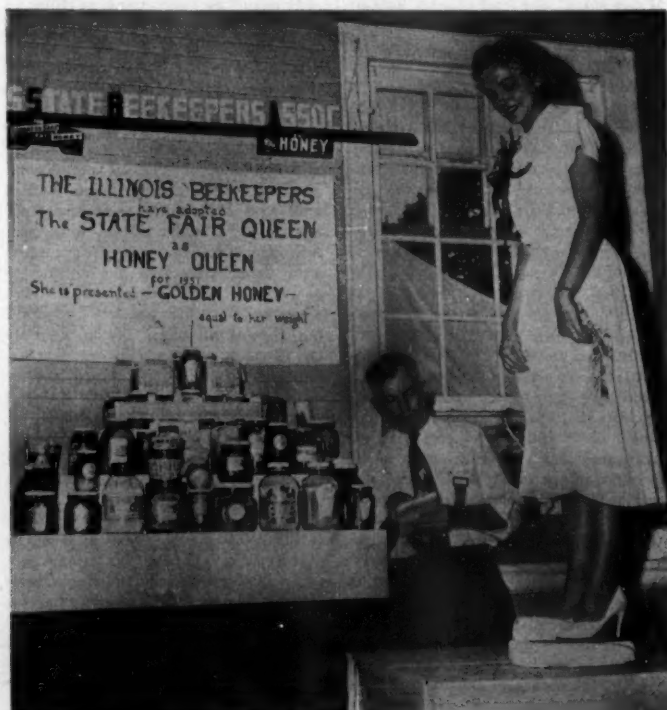
him that you will stand to your bargain. You will be surprised to know that people will pay extra high prices for fine white tender comb in glass. There is no need to cut prices on such honey. Five years from now it will be interesting to know how far on the high road to bigness you fellows have gotten who are packing this fine white honey for the wholesale houses so it can be retailed at 59 cents a jar.

It might be interesting to think of the class of people who buys honey. Never insult a farmer by trying to sell him a pound jar of honey. Get him five pounds or five gallons and a spoon. People with full stomachs rarely buy extract honey. They are hard to sell any kind of honey. There is a strata of middle class folks who are well to do, many of them retired who love nice things and live well. By and large they are the ones that buy our chunk honey. They know what they want and are willing to pay for it. Don't cut prices to them. They would think you are trying to put something over. Then there is the great mass of miners, carpenters, teamsters, car mechanics and day laborers, the men who lay out the muscle to drive the heavy wheels of industry. They are the boys who eat the great bulk of our honey and they care mighty little for comb. And don't fool yourself about their ability to pay. The carrying charges of a three hundred billion dollar debt are met by taxes and yet none of us pay taxes as such; rather their costs are relayed to us in advance prices on the goods we buy. Now if we are not smart enough to levy a commensurate charge on the honey we sell then we are sunk.

Missouri

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Honey Queen

Queen of the Illinois State Fair and Honey Queen, Miss Marlene Bohn of Joliet steps on the scales so that Carl Killion can check her weight. The Queen was presented with her weight (116 pounds) in honey by Illinois beekeepers. Her prizes were nothing short of staggering. In addition to the honey she received a new car, 1000 gallons of gasoline, a new diamond ring, a new fur coat, a trip to New York City for herself and her mother, and trips to several other state fairs as a guest.

Similarly, Michigan has a Honey Queen this year, Miss Barbara Seidelman of Ionia. At the Michigan State Fair held in Detroit, the Queen rode on a float in the parade up Woodward Ave. The honey bee was selected as the star of this year's agricultural display at the fair, demonstrating its value to the state in pollination and honey production.

This sort of publicity is good for honey sales and it would be well for other states to use similar ideas.

It's A Honey ... Of A Time Saver.

The new Lewis Nail-less Topbar Frames save you valuable time regardless of the type or kind of foundation you use with it.



Your neighborhood Lewis-Dadant Beeware Dealer will be glad to show you how it folds together.

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We are closing our queen yards for this season. Orders filled only as long as supply in Nucs. lasts. These are choice queens just like we are using in our own requeening. Use as many of them as you can, and note the difference in next spring's build-up.

Getting at least two cycles of brood hatched before cold weather slows up egg laying, is fine wintering insurance. More winter losses are attributable to poor queens than any other cause except the lack of proper stores.



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Pat. Off.

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25-99 -- 85c each
100-up -- 75c each

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1.10 each
1.00 each

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